

The Canadian Medical Association Journal

Vol. XXIV

TORONTO, APRIL, 1931

No. 4

THE DIAGNOSIS OF PREGNANCY WITH THE ASCHHEIM-ZONDEK TEST

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BY customary clinical means a definite diagnosis of pregnancy cannot usually be made earlier than the third month. A test which would permit earlier diagnosis is highly desirable. A number of laboratory tests have been devised, but only recently has one been found which is sufficiently accurate. In over four thousand trials, in which it has been applied by various investigators, the Aschheim-Zondek test has given correct results in more than 98 per cent of the cases. This is remarkable accuracy for a biological test.

Aschheim and Zondek¹ found that the urine of pregnant women contained a substance or substances which exerted physiological effects similar to those produced by the sex hormone or hormones of the anterior lobe of the pituitary gland. This active material is absent from the urine of normal females and of males. When properly prepared extracts of the anterior pituitary gland are injected into immature female mice, or certain other young animals, a precocious sexual maturity is produced. The immature ovary is stimulated to growth, one or more follicles ripen, ovulation occurs, and intensive luteinization sets in. From the maturing ovary oestrin is liberated and this hormone causes the hypertrophy of the uterus and of the vagina characteristic of normal oestrus. The anterior pituitary active substance or hormone has no direct effect upon the uterus, as the secondary changes described fail to occur in a spayed animal.

The urine of pregnant women contains both the substance which resembles, physiologically, this anterior lobe hormone, and oestrin. The first appears in the urine in large amounts shortly after impregnation; oestrin, according to Aschheim and Zondek,² does not appear in large amounts until the third or fourth month. The Aschheim-Zondek test is based on the presence of the substance similar to the anterior lobe hormone. The changes which it produces in the ovaries after injection of the urine into immature mice are observed. Precocious sexual maturity is induced. The changes noticed are threefold:—

1. Ripening of follicles, ovulation and oestrus.
2. Blood spots, *i.e.*, hæmorrhages into follicles.
3. Luteinization of follicles and formation of corpora lutea atretica, *i.e.*, corpora lutea containing oöcytes.

The uterus of the test animal may be enlarged, not only by the oestrin liberated from its ovaries but possibly also by that present in the human urine. Since oestrin is not secreted in large amounts in early pregnancy, and also because it may be present in urine as a result of ovarian disorders, any uterine change is of questionable diagnostic value. The ovarian changes alone are considered in the interpretation of the results of the test. Of these, either the second or third, or both together, is diagnostic of pregnancy.

The studies of Erdheim and Stumme³ have shown that during pregnancy in man the

anterior portion of the pituitary gland hypertrophies, and it seems likely that an increased secretion of its sex hormone occurs. The important question whether the sex hormone, which is responsible for the changes observed in this test, is formed in the anterior lobe of the pituitary gland or in the placenta, is still an open one. It is interesting to note that this factor has been demonstrated in the urine of primates only. A number of reports, mostly from European sources, have appeared on results secured with the Aschheim-Zondek test. In the following table most information immediately available, except that contributed by Louria and Rosenzweig⁴ and by Mazer and Hoffman,⁵ is summarized. In the work of Louria and Rosenzweig the error is large, due to the use of mice older than those which should be employed. Mazer and Hoffman compared the Aschheim-Zondek test with that of Siddall, and with their own test which is based on the presence of cestrin in the urine. All three methods in their hands gave large errors. This result is not in harmony with that found by other workers, and their error is due to a failure to secure positive results in pregnant cases rather than to incorrect negatives. The reasons for this failure are not apparent from a study of their paper. The papers of Crew⁶ and Robertson,⁷ reporting the results secured at the Pregnancy Diagnosis Station in Edinburgh, are satisfactory, both in regard to the number of cases and in the care which has been exercised. Their results leave no doubt as to the usefulness and accuracy of the test.

TABLE I

Authors	Total Number of	
	Tests	Error
Aschheim and Zondek ⁸	880	12
Allan and Dickens ⁹	237	7
Mack ¹⁰	259	3
Crew and Robertson ^{6, 7}	907	18
"Frankfurt" ¹⁸	350	5
"Charlottenburg" ¹⁸	100	2
Solms, E. and E. Klopstock ¹¹	349	3
Liese, G. and E. S. Auer ¹²	89	2
Ehrhardt, K. ¹³	400	7
Addessi, G. ¹⁴	71	1
Stal, P. L. ¹⁵	905	20
Guldberg, E. ¹⁶	80	1
Zondek ¹⁷	200	4
(Exclusive of 880 given above)	4,827	85
Percentage of accuracy =	98.2	—

It is of interest to enquire whether a positive result is obtained in conditions other than pregnancy. Consideration of the results above reported shows that one may anticipate a positive result in hydatidiform mole, chorion-epithelioma, and incomplete removal of placental tissue. In fact, the test is positive when active placental tissue is present, and is properly, then, a test for the presence of living trophoblast. Extracts of fresh placenta will give a positive result, but not extracts of the fetus or of placental tissue which has not had an active existence within a week. Thus the reaction is usually negative in cases of missed abortion, unless the urine is obtained within one or two days, in which case the test may be positive. Positive reactions are not given by urine of patients suffering from ovarian tumours or from various other diseases of the genital organs. These facts and others are incorporated in the following table.

TABLE II

Positive Mouse Reaction	Negative Mouse Reaction
Normal pregnancy	Normal non-pregnant women
Ectopic pregnancy	Missed abortion (generally)
Hydatidiform mole	Tumours of ovaries and uterus
Chorion-epithelioma	Amenorrhœa: menopause, lactation, debilitating conditions, for example, tuberculosis.
Incomplete abortion	endocrine disturbances

METHODS

Although we have investigated various modifications of the Aschheim-Zondek test, the results reported here have been secured by the technique described in the original papers.^{1, 2} The urine used is preferably the first morning sample, as it is concentrated. In most of the tests here reported the sample has been voided, but under certain conditions it may be desirable to secure a catheter specimen. The urine should be kept in a refrigerator until it is used, and a drop of trieresol may be added. The urine is slightly acidified with acetic acid and filtered. For each specimen of urine five young mice, from three to five weeks old and weighing 6 to 8 grams, are used. It is extremely important that the age limit be observed; older mice are apt to come into maturity spontaneously during the test period. Each mouse is

given 2 c.c. of urine subcutaneously. This amount is administered in six equal doses in three days. On the fourth day one of the mice is killed and examined. If the ovaries of this

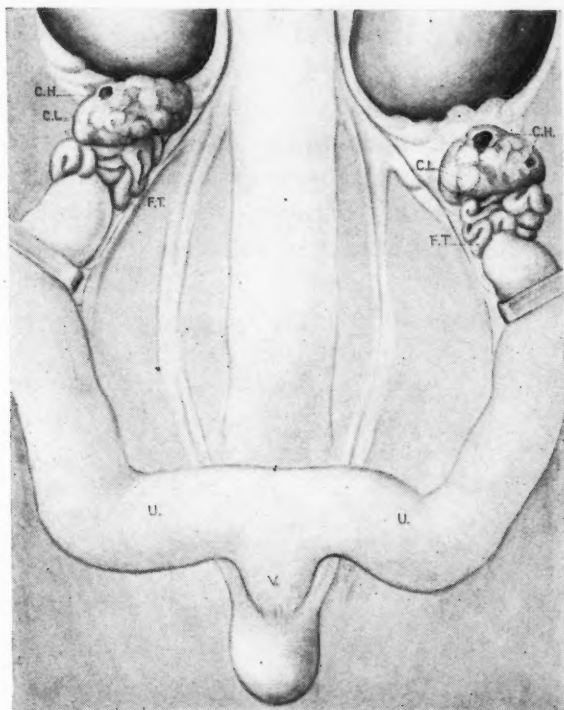


FIG. 1.—Genital tract of mouse treated with urine of pregnancy.

O.—Ovary F.T.—Fallopian tube
C.H.—Corpus hemorrhagicum U.—Uterus
C.L.—Corpus luteum V.—Vagina

mouse have matured, the rest of the group are killed and the result is known three days from the beginning of the test. If the examined mouse be negative, the remaining four mice are left until the next day because of the possibility of rupture of the follicles occurring later than the fourth day. A control mouse, weighing as much or more than the heaviest mouse in the group, is killed and examined with each test lot.

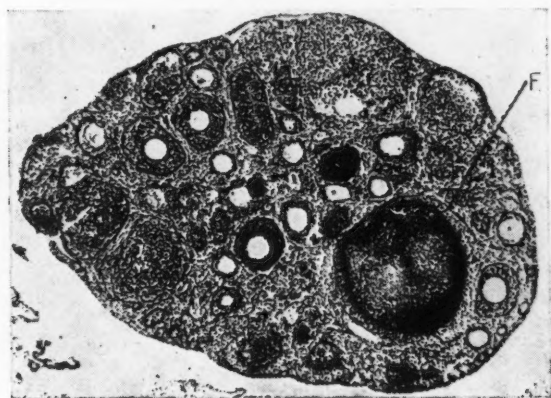


FIG. 2.—Ovary of mouse showing large hæmorrhage into Graafian follicle (F). Positive reaction.

The changes occurring in the mouse as a result of the injection of urine from a pregnant woman are as follows (see Fig. 1). The ovaries are much increased in size. One or more follicles have ruptured, and from the remnants have developed one or more corpora hæmorrhagica. These are macroscopically visible as blood spots. Typical corpora lutea may also be present, which are evident as more solid yellow bodies. The intense luteinizing reaction often occurs in follicles from which the egg has not escaped (see Figs. 2 and 3). A section of the matured ovary shows a marked increase in size of numerous Graafian follicles. In contrast, the ovary of a control mouse (Fig. 4) from the same litter is smaller, exhibits no blood-spots, and on section is seen to contain only immature follicles (Fig. 5). In addition to the changes produced in the ovaries by the urine in pregnancy, the œstrin produced by the maturing mouse ovaries, or perhaps contributed by the urine, usually causes changes in the uterus which are macroscopically evident. The uterine changes are useful aids in diagnosis, but are not alone satisfactory as criteria.

It is stated in the literature that about 6 per cent of urines are toxic. This may be due to bacterial action or to toxic substances present in the urine. In three cases we have found that such urines were rendered harmless by shaking with ether and discarding the ether fraction. Residual ether was removed from the aqueous solution *in vacuo* at room temperature. Unless there was reason to suspect bacterial

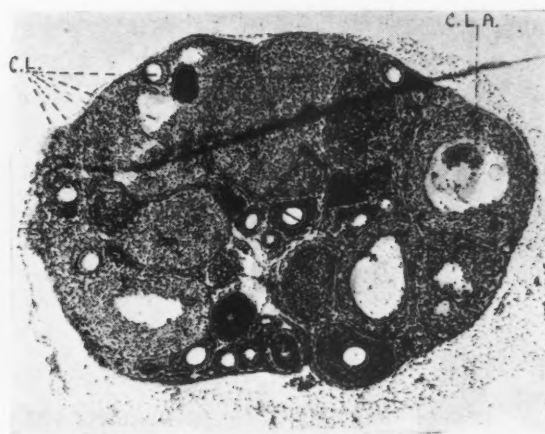


FIG. 3.—Ovary of mouse showing many corpora lutea (C. L.). One follicle shows lutein cells around an ovocyte and some hæmorrhage, corpus luteum atreticum (C. L. A.)

action, however, the urines were injected directly without extracting with ether.

The advantage of a test for pregnancy requiring less time than the Aschheim-Zondek reaction is quite evident. Friedman¹⁸ has shown that urine from pregnant women produces ef-

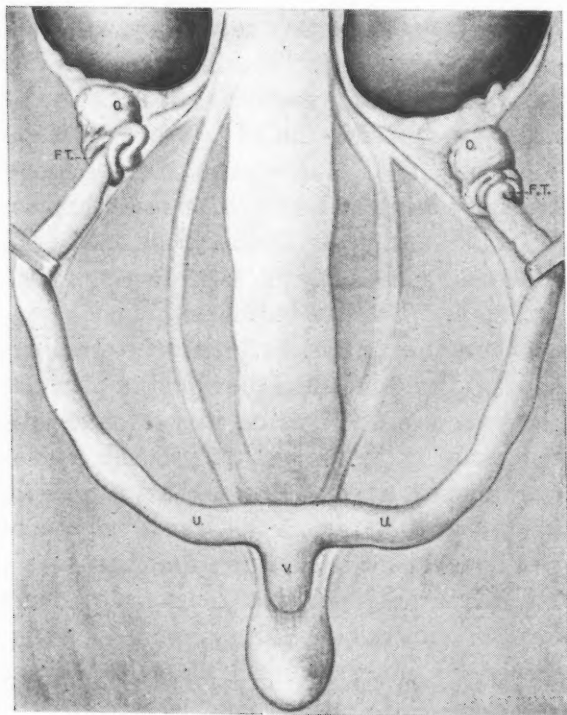


FIG. 4.—Genital tract of immature mouse.

fects on the rabbit's genital tract similar to those observed in the mouse. The rabbit test has the advantage, however, of requiring only 24 to 30 hours for its completion as compared with the 72 to 100 hours for the mouse test. The rabbit method has been tried out by Schneider¹⁹ on one hundred cases with an accuracy at least as high as that of the Aschheim-Zondek test. Five c.c. of urine are injected intravenously in a single dose into a 12 to 14 weeks' old rabbit, and the animal is autopsied twenty-four hours later. The same criteria utilized in the Aschheim-Zondek test are used to determine the presence or absence of the active material in the urine. This rabbit test could be readily conducted, at a somewhat increased cost, in cases where speed of diagnosis is important. On the other hand, for a routine test the mouse has obvious advantages which possibly outweigh the disadvantage of the longer time required. In the few cases in which we have employed the rabbit as a test animal, the results

have been identical with those secured with mice.

The results presented in this paper have been secured in Kingston and in Toronto. A majority of the cases investigated at Kingston have been patients at the General Hospital, under the care of Dr. G. W. Mylks, Professor of Obstetrics and Gynecology, whose cooperation is much appreciated. The tests made were all genuine efforts to establish, not confirm, a diagnosis of the condition of the patient. In connection with most of the Toronto cases the

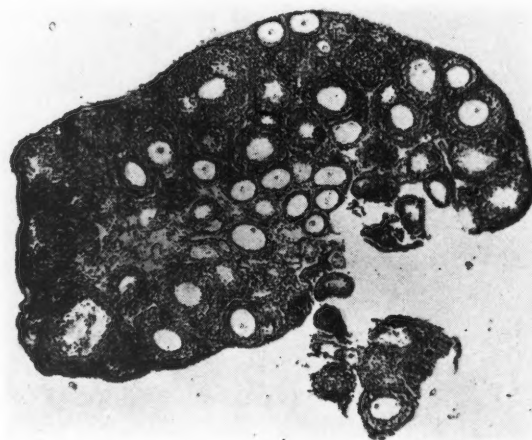


FIG. 5.—Ovary of normal mouse, three weeks old.

clinical information was secured through the kind cooperation of members of the Department of Obstetrics and Gynecology of the University of Toronto. We are particularly grateful to Drs. W. B. Hendry, H. B. Van Wyck, H. W. Johnston, W. A. Dafoe and D. N. Henderson.

We have examined urine from 112 cases in which pregnancy was suspected, and the Aschheim-Zondek test gave a positive result in 81 of these cases. In these 81, clinical information subsequently proved that, at the time the test was conducted, the patients were grouped as follows:

TABLE III		Cases
Pregnant, 3 to 9 months	.....	53
" 8 to 12 weeks	.....	7
" 4 to 8 weeks	.....	11
" up to 4 weeks	.....	4
Ectopic pregnancy	.....	2
Hydatidiform mole	.....	1
Incomplete abortion	.....	3

In the 31 cases in which the test was negative, clinical examination subsequently established the following conditions:

Menopause, 2; amenorrhœa of unstated origin, 14; amenorrhœa during lactation, 1; amenorrhœa due to tuberculosis, 1; oligomenorrhœa, 2; adeno-carcinoma of ovary, 1; abortion with dead fetus, 2; chronic sub-involution of uterus, 1; pelvic abscess, 1; inflammation of pelvis, 1; enlargement of uterus, 1; tube-ovarian abscess, 1; cystic degeneration of the cervix, 1; parametritis, 1; missed abortion, 1.

The last patient cited was delivered three months after the test of a very badly macerated hydrocephalic fetus. She had never carried a pregnancy to full term, and had previously been delivered of an anencephalic fetus. The negative reaction of the Aschheim-Zondek test indicates either that the fetus had been dead when the urine was examined, or that the patient's frequently demonstrated inability to carry on a pregnancy to term is due to lack of the anterior pituitary hormone, as suggested by Robertson.⁷ In no other case where the test was negative did the patient subsequently prove to have been pregnant at the time the test was made. As a control, urine from 25 normal women was examined. None of these samples produced a positive reaction in the test mice.

A chemical test which could be quickly completed would be convenient. Voge,²⁰ of the Edinburgh group, has recently reported that bromine water gives a colour reaction when mixed and heated with a sample of urine from a pregnant woman. This is, of course, the test which Knoop developed for the qualitative determination of histidine. It is difficult to believe that such a test would be specific for pregnancy. Dodds²¹ found that the reaction was negative in 25 per cent of pregnant women, and considered that the test was useless. We have examined 57 of the cases reported above with the following results:

TABLE IV

<i>Aschheim-Zondek Test</i>	<i>Voge Test</i>	<i>Total</i>
Negative	Negative	33
Positive	Positive	12
Positive	Negative	8
Negative	Positive	4

This chemical test devised by Voge is therefore inaccurate, and we cannot recommend its use. Based, as it is, on the presence of histidine, which is likely to be present in the urine

in conditions other than pregnancy, it can offer little aid. In the 137 cases, tests on which are reported, the Aschheim-Zondek test has been found to be extremely trustworthy—more accurate than any other valuable biological test. The accuracy, the simplicity, and the reasonable cost combine to make the test desirable and feasible. In an editorial review in this *Journal* (February, 1930), it was stated "that the test should be generally available". Our experience leads us to support this view. The verdict on the value of this test must, of course, be given by the practising physician. It would appear that laboratory assistance in establishing the presence of a very early normal, or an ectopic pregnancy, or in differentiating between fibroids or ovarian tumour and pregnancy, might at times be helpful.

SUMMARY

Specimens of urine from 112 cases of suspected pregnancy and from 25 controls have been submitted to the Aschheim-Zondek test. In every case investigated the results of the test have been consistent with the subsequent clinical diagnosis. This confirms the work of several investigators as to the reliability of this test in the diagnosis of pregnancy.

In the section of the work carried out in Toronto the helpful advice and direction of Dr. C. H. Best has been of great assistance.

We are greatly indebted to the staff of the Medical Art Service, University of Toronto, for Figs. 1 and 4.

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PRODUCTION OF DECIDUAL CELLS IN AN OVARY ABOUT A PRIMARY CHORIO-EPITHELIOMA*

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WHILE studying a case of primary chorio-epithelioma of the ovary we noticed the presence of decidual cells in the ovarian stroma. Decidual differentiation co-existing with a chorio-epithelioma has not been reported so far, yet it appears to be of great importance. A discussion on the origin of the chorio-epithelioma will be published later; we shall confine ourselves in this paper merely to a description of the tumour

zones surrounded by grayish strands. At the lower part was found a little white nodule which microscopically was shown to be ovarian stroma, with Berger's sympathicotrope cells. The remnants of ovary included in the tumour showed clearly that the latter arose from the ovary itself. The tube and the uterus were examined and found to be completely intact.

Histologically, most of the tumour shows areas

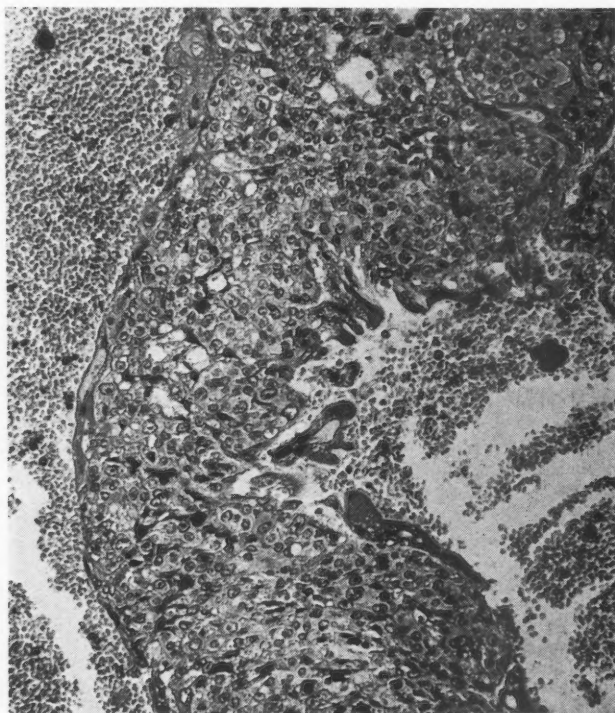


FIG. 1.—Chorio-epithelioma. A large tumour villus composed of cells of Langhans type, bordered by large syncytial masses.



FIG. 2.—Perivascular decidual cells. Note the small vessel in the centre, surrounded by a multistratified sheath of typical decidual cells.

and the decidual cells, and only a few facts relating to the nature and genesis of these will be considered.

The chorio-epithelioma appeared in a woman aged 42, whose last confinement occurred six years ago. The tumour, surgically removed (by Dr. A. Magnan), was of the size of a grapefruit, and showed on section large hæmorrhagic

of more or less altered blood, of fibrin and necrosis, surrounded by a few neoplastic fragments. The most characteristic areas are found near the invaded ovary (Fig. 1). Here the strands closely recall the chorionic villi of the placenta. They differ, however, in that they are limited to the epithelial layer, which is multistratified, and the connective-tissue axis is missing. The villi of the tumour are bordered by large, flattened syncytial masses. These show a dark proto-

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plasm, mostly vacuolated, and contain several nuclei. On their surface there are numerous, very fine, short projections which produce a brush-like appearance. These are best seen after staining with Mallory's phosphotungstic hæmatoxylin. Beneath the syncytial layer are cells of a different kind. These cells are polygonal from mutual pressure; their cytoplasm is clear but not homogeneous; their nuclei are uniform in size and contain a finely granular chromatin. In a word, they are similar to the Langhans cells.

The tumour cells have destroyed by their contact the ovarian stroma and the blood vessels. The resulting hæmorrhage infiltrates the normal and neoplastic tissues, and compresses and dissociates the latter. As a result there is an increasing amount of blood in the tumour.

To summarize, *the tumour is a typical chorio-epithelioma.*

In the ovarian tissue, but outside the invaded zones, are sheaths of multistratified cells around capillaries or small vessels. These cells are large, pleomorphic, oval, elongated, or club-shaped. Each of them is surrounded by a thin collagen layer. The pale cytoplasm contains granulations, and the nucleus, faintly stained, is oval and occupies the centre of the cells. *They are characteristic decidual cells (Fig. 2).*

The appearance of decidual cells around vessels, during normal pregnancy, has been noted in the deciduates by Hubrecht (quoted by Gerard). Pol Gerard¹ has studied the phenomenon especially in a little African insectivorous animal,

Nasilio brachyrrhynchus. Our findings are identical with his. The connective tissue surrounding the vessel becomes cedematous, and the anastomosed fibroblasts form a loose network. In the meantime, these fibroblasts grow in size, break away from their anastomoses, multiply, form a multistratified sheath around vessels, whilst the protoplasm becomes loaded with fine granules.

What is the cause of that decidual differentiation? Some hold that the hormone of the corpus luteum or œstrin is responsible; others, the follicular hormone; while still others believe in a placental hormone action.

In our case, where there are neither follicles nor corpus luteum, we have to deal with a tumour of pure chorio-placental elements, therefore with elements which represent the fetal placenta solely. Then it is not illogical to believe that the appearance of decidual cells is caused by a secretion of the chorio-epithelioma elements. If the perivascular decidual cells of our tumour have been differentiated under the hormonal action of the chorio-epithelioma it seems that the hormone which gives rise to the appearance and multiplication of the decidual cells in normal pregnancy may come exclusively from chorio-placental elements. In other words, if our interpretation is correct, it suggests the existence of an hormone which, secreted by the elements of the fetal placenta, determines the production of the characteristic cells of the maternal placenta.

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IS THE COMPLEMENT FIXATION REACTION RELIABLE IN SHOWING WHETHER GONORRHOEA IS CURED?—The value of the complement fixation reaction in gonorrhœa would be greatly increased if it could be used not only in diagnosis but in determining whether a case is cured. Before it can be used for this purpose, it is necessary to determine whether it becomes negative immediately after cure or not for a considerable period after. Opinions are divided as to the length of time the reaction persists. The author examined 136 cases with a view to answering this question. Examinations were made twice a week. He used gonargin as an antigen, and found it as useful as gonococcus antigen. He not only determined the reaction but titrated the positive sera to determine the antibody content. He found that the complement fixation reaction in gonorrhœa is, with a few exceptions, a specific reaction, which is often present in uncomplicated cases, and practically always positive in complications with changes in the deeper tissues. In uncomplicated gonorrhœa the reaction is less strongly positive and therefore does not persist so long. It disappears after an average period of four to eight weeks, often even before clinical recovery.

In complications that cause deeper tissue changes, the reaction is more intense, but its degree of positiveness does not always correspond to the severity of clinical symptoms. The disappearance of the reaction also shows different types and it is not always in direct proportion to the retrogression of the symptoms. Generally in inflammations of the prostate and seminal vesicles the reaction is long-continued and its intensity decreases slowly. Clinical restoration to normal is also often slow in these cases, and most of the recurrences are in cases with complications in the seminal vesicles and prostate. Often they occur after the complement fixation reactions become negative, but sometimes it is still fully positive. In complications that can be cured quickly and leave no traces, the reaction also quickly becomes negative. From these facts the author concludes that a stubborn positive reaction is always caused by a focus of gonococci somewhere in the body, and if a reaction is positive three months after cure, it does not mean that the patient has had the disease, but that he still has it. Such individuals are not cured and consent to marriage should not be given.—Ludwig v. Heiner, *Dermat. Wochenschr.*, 1930, 91: 1308.

THE AZYGOS LOBE OF THE LUNG

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IN the course of routine radiographic examinations of the chest, extending over a period of several years, an abnormality in the right upper lung was noted on two or three occasions, the nature of which was obscure. This abnormality took the form of a curved linear shadow running downwards and somewhat outwards from the apical region to a variable distance from the lateral aspects of the vertebræ, then passing in a smooth curvature

mesially and downwards to about the level of the second costal cartilage. At the lower end the shadow expanded into an elongated and roughly triangular density which varied in size from 0.5 to 3 mm. In one case the shape assumed was cylindrical, the diameter being about 3 mm. over a length of about 3.5 cm. It was felt, in the first instance met with, that the condition might represent a pleural band, though its general contour and

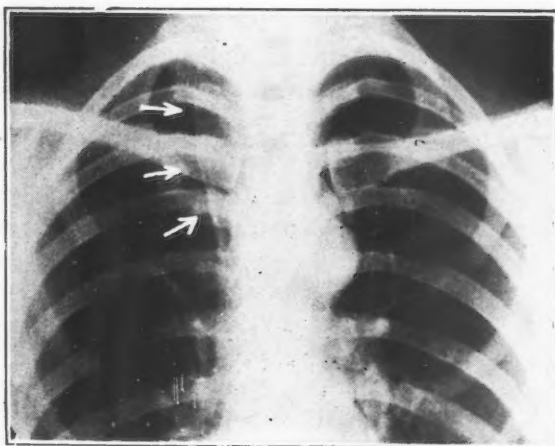


FIG. 1.—(Case 1). Age 33. Azygos lobe is clearly outlined. No important chest findings.

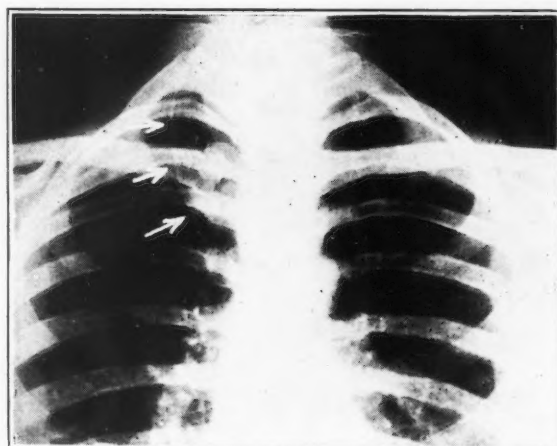


FIG. 2.—(Case 2). Age 33. Referred for roentgen examination of heart. No important chest findings. Arrows indicate pleural reflection of azygos lobe.

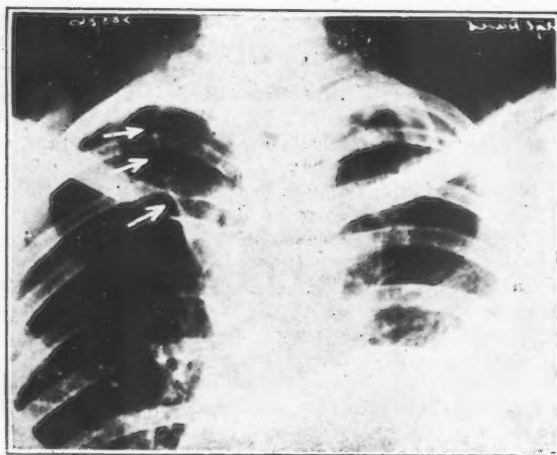


FIG. 3.—(Case 3). Age 18. Azygos lobe shown in right upper lobe. Infiltration upper third both lungs, involving azygos lobe on right side, with effusion in left base.

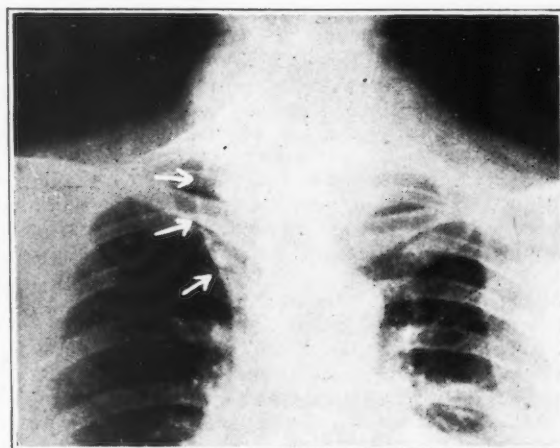


FIG. 4.—(Case 4). Age 42. Colloid goitre. Referred to demonstrate possible substernal thyroid. Typical azygos lobe and with shadow of a small substernal thyroid visible on both sides.

symmetry were rather against this view. The abnormality was not associated with deviation of the trachea, such as would probably have been present had the condition been due to a substernal thyroid, nor was the appearance that of a large persisting thymus gland. Later, when a second, almost identical, case was found, it was apparent that we were dealing with a condition the identity of which was not established and which probably was developmental.

Reference was made to the work of Wessler and Jaches¹ who, it was found, had in 1923 reported a similar falciform shadow presenting the general form mentioned above. These authors observed that the shadow was always found on the right side in the apical region, and, while its significance was not clear, they believed it to have no clinical importance. A subsequent review of the literature showed that Velde,² in 1927, had suggested that the cause of the x-ray shadow might be an azygos lobe of the lung, but had been unable to confirm his opinion by post-mortem findings. The first mention of the existence of an accessory lobe in the right apex was found to have been made by Wrisberg in 1778 from anatomical studies, the structure being therefore sometimes designated the *lobus Wrisbergi*. In 1928, Bendick and Wessler³ described a series of 50 cases showing this condition, seen over a period of 15 years, in which the presence of an azygos lobe had in 2 instances been confirmed by autopsy. Stoloff,⁴ in 1929, published a report of 6 cases. St. Craur,⁵ in the same year, described briefly 3 cases of azygos lobe and also observed the fact that a substernal thyroid gland, a large thymus and pleuritic bands simulated the anomaly. Nelson and Simon⁶ recently have reported 4 more cases.

Normally, the azygos vein proceeds up the posterior mediastinum on the anterior surfaces of the vertebral bodies slightly to the right of the mid-line, passing over the intercostal arteries, with the thoracic aorta and thoracic duct to the left. At the fourth, or sometimes the third, dorsal vertebra it bends forward and to the right, curves over the right bronchus and right pulmonary artery, and descends slightly to open into the posterior surface of the superior vena cava.

In describing variations of the lobes and fissures, Piersol⁷ remarks that "the azygos major vein may be displaced outwards so that, instead of curving over the root of the lung, it may make a deep fissure in the upper part of the lung, marking off an extra lobe." It is apparent that the lateral displacement of the vein represents a maintenance of its fetal position. It has, moreover, been shown, by injection of the bronchial tree in the post-mortem specimen, that the supply of the azygos lobe is derived from a branch of the eparterial bronchus. Had the accessory lobe originated as a primary developmental defect its bronchus would have been given off as a separate branch from the right main trunk.³

The reflection of the parietal pleura resulting from the aberrant course of the vein as it sweeps forward and downward through the lung is responsible for the fine crescentic shadow in the apical region, the pleura being visualized by reason of an antero-posterior projection which shows it, as it were, edge on. The expanded triangular lower end of the curved line is due to a cross-sectional view of the vena azygos at its point of confluence with the superior caval vein. The size of the lobe thus demarcated may be so small as to be concealed by the great vessels, or may be of the size shown in the accompanying roentgenograms. A slight obliquity in the course of the vein, or a film centred above or below it in the horizontal plane, will project its shadow as a drop-like structure, or show it as an elongated triangular or cylindrical density.

The anomaly must be differentiated from a substernal thyroid gland, a large thymus, and pleural bands, as observed above. In addition, Gianturco⁸ remarks that the structure may be simulated by the edge of an annular bronchiectasis at the apex, by the edge of cavities and of a spontaneous circumscribed pneumothorax.

The 4 cases here described are presented merely to direct attention to the structure, the recognition of which, as will be seen, has been accomplished only comparatively recently. There are no features in any of the cases of particular interest clinically. Case 3 presented the typical radiographic appearance of a tuberculous infection involving the upper third of both lungs, with pleuritis with effusion at the left base, the distribution and character of the

infiltration in the right apical region being in nowise changed by the pleural reflection of the azygos lobe. A case of pleural effusion of the fissure has been reported, and Müller cites an instance in which the bronchus was so narrowed by pressure from the aberrant azygos vein that multiple dilatations and diffuse fibrosis of the lobe resulted. The chief importance however of the recognition of the anomaly lies in the avoidance of erroneous in-

terpretations of its structure in terms of disease.

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ACUTE MERCURY POISONING: REPORT OF TWENTY-ONE CASES WITH SUGGESTIONS FOR TREATMENT

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MERCURY compounds have been used in medicine for centuries, but only within the past fifty years has acute mercury poisoning assumed an important rôle. About 1880, bichloride solutions began to be used as antiseptics, and their introduction resulted in a sudden and large increase in the number of reported instances of mercury poisoning. These commonly followed irrigation of the vagina, uterus or surgical wounds. Moreover, within the past two decades, mercury compounds have become more commonly used as suicidal or homicidal agents.

Between the years 1918 and 1928, 21 patients with acute mercury poisoning were treated in the Henry Ford Hospital. The main details regarding them are outlined in the accompanying table and are used as a basis for a discussion of the problem. All preparations of mercury are poisonous if absorbed, and once the drug has entered the circulation the mode of action in each case is very similar. Death has been reported as having been due to each of the various pharmacopœal preparations. The metal volatilizes at temperatures above 41° C. and the vapour is quite poisonous. In the liquid form however metallic mercury can scarcely be considered dangerous. Instances are on record where large doses have been taken without ill effect. That small amounts are absorbed is, however, evident from the finding of the metal in the urine of patient No. 7, who swallowed metallic mercury with suicidal intent. Such absorption is brought about by the formation of soluble mercury compounds in the intestinal tract, especially if the

metal remains in the bowel for several days. Unguentum hydrargyri dilutum is a common representative preparation into the composition of which metallic mercury enters. Poisoning from blue ointment is usually mild, as in cases Nos. 8 and 13. Death, however, may result from its use.

Mercury is commonly found in the urine of dentists and in people with amalgam tooth fillings. The tests commonly used are capable of detecting mercury in very low dilutions. Vogel and Lee's method is sensitive to 1/40 mg. in 50 c.c. of the solution to be tested, and Elliott claims that his technique can detect 1/15,000 mg. of mercury in 500 c.c. of distilled water. The amounts excreted in individuals with amalgam in the teeth are very small. It has not been proved that these quantities are harmful except in the extremely susceptible person. Martinet reports a patient in whom severe acute symptoms resulted from absorption from an amalgam tooth filling. Calomel in susceptible individuals may prove fatal and mercuric oxide, both the red and the yellow, have occasionally been the cause of death. MacNider has shown that naturally nephropathic dogs are susceptible to acute mercury poisoning and it seems reasonable to believe that patients with nephritis are less able to withstand large doses of this drug. More recently, since the introduction and intravenous use of such organic mercurial compounds as mercurochrome, metaphen, merbaphen and salyrgan, acute poisoning has occurred in susceptible individuals from their injudicious use.

Bichloride of mercury is by far the commonest compound causing acute poisoning. It was the drug responsible in 18 of the 21 patients reported. It is soluble in water, alcohol and particularly in solutions of common salt and other alkaline chlorides; with albumin a compound is formed which is insoluble in water but soluble in an excess of fluid albumin. It is commonly prepared in blue tablets containing 7.3 grains or 1.82 grains. Mercury bichloride is also used in the preparation of some cosmetics and many liquid insect destroyers.

The majority of our patients were young adults, the oldest being 56 and the youngest 22, with an average age of 30.8 years. There were twice as many females as males, and all but one were of the white race. In four, poisoning was definitely accidental, while six admitted having taken the drug with suicidal intent. In the remainder definite information was not obtainable, but it was believed that the majority had attempted self-destruction. Poisoning in cases Nos. 1 and 21 was due to the use of bichloride solution as a douche. Both of these patients died. More recently, poisoning from this source has become less common, partly because the medical profession has finally realized the danger connected with the promiscuous use of bichloride of mercury, and, moreover, the public is becoming better educated as to its poisonous properties.

The lethal dose of mercury bichloride is usually estimated as from 3 to 5 grains for the average adult of 70 kilograms. This would be 2.7 to 4.6 mg. per kilogram of body weight. Sansum has shown that the minimum lethal dose for a dog is 4 mg. per kilogram when given intravenously. Such small doses when taken by mouth produce death only if completely absorbed. One patient is reported to have taken 192.6 grains and recovered. Lambert and Patterson's patient died in five and one-half days after having been given 1.5 grains intravenously. This person was probably highly susceptible. Harmon has recently reported 4 patients who died in from 6 to 12 days following the intravenous administration of mercury bichloride in doses of at least 6 mg. per kilogram of body weight.

In our patients the exact size of each dose could not always be learned, but in each instance, except two, as accurate an estimate as possible was made from the number and size of the tablets used. The largest dose was 27 grains and the smallest 0.75 grains. Of those taking the drug by mouth, all used mercury bichloride, except pa-

tient No. 7, who swallowed about 15 c.c. of metallic mercury in a glass of whiskey. In 2 patients, poisoning resulted from inunction and in 2 the portal of entry was the vagina. Patient No. 1 had been using mercury bichloride solution as a vaginal douche daily for three months before hospitalization, and patient No. 21 had used three large tablets (21.9 grains) in a single douche, 11 days before admission. Patient No. 8 had taken a daily inunction of blue ointment for 12 days for impotence, on the advice of a quack, and No. 13 had used this same compound for pediculosis pubis for 6 days before seeking treatment.

From a practical standpoint it does not depend so much upon the amount of the drug ingested as upon the amount absorbed. In the 17 instances in which the drug was taken by mouth the longest period before hospitalization was two days, and the shortest one-half hour, the usual time two hours. During this interval the amount of mercury which has entered the circulation will depend upon a number of factors. By inquiry concerning these a better estimate as to the probable severity of the poisoning can be arrived at. If the compound is soluble, or already in solution, it is absorbed rapidly and leaves the stomach quickly. If the drug is taken soon after a meal, a portion unites with the food to form insoluble mercury proteinate and this retards early absorption. Immediate administration of milk and eggs acts in a similar manner. Early spontaneous or induced vomiting may result in much of the poison being expelled. No matter the route by which absorption takes place, this begins immediately and is rapid in the early stages. When ointment is applied to the skin some observers believe that a portion of the mercury enters the circulation by way of the lungs as a vapour, and is gradually taken up from the blood and fixed by the tissues. It does not, however, soon disappear from the circulation, as is evidenced by Rosenbloom's case in which 30 per cent of the total amount was found in the blood of a patient dying 13 days after using a bichloride douche. In the case of persons succumbing to acute poisoning the largest amounts of mercury are obtained in the liver, kidney, blood and muscle, although the metal has been demonstrated in every tissue and fluid of the body.

Mercury is excreted by the large bowel, by the kidney, by the liver, by the gastric mucosa, by the salivary glands and to a small extent by the skin. Excretion begins early and mercury may appear

ACUTE MERCURY POISONING

Case Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Sex	F.	M.	M.	M.	F.	F.	M.	M.	F.	F.	F.	F.	M.,	F.	F.	F.	F.	M.	F.	F.	F.
Age	27	52	40	25	35	24	56	32	28	25	23	25	28	32	22	24	32	33	23	32	28
Civil Status	M.	M.	A.	S.	M.	M.	M.	S.	D.	M.	Sep.	D.	S.	M.	M.	D.	M.	M.	S.	M.	M.
Weight - lbs.	130	180	120	140		130	145	127	128	108		117	131	186	120	125	130	133		122	128
Occupation	Hw.	Clerk	Clerk	Laborer	Hw.	Hw.	Clerk	Laborer	Hw.	Hw.	Hw.	Clerk	Clerk	Hw.	Hw.	Hw.	Hw.	None	Hw.	Waitress	Hw.
Suicidal	No	.....	.....	.....	.....	Yes	Yes	No	.....	Yes	.....	.....	No	.....	.....	.....	.....	Yes	Yes	Yes	No
Dose	?	15 gr.	5 gr.	14 gr.	15 gr.	14 gr.	15 c.c. Hg.	?	10 gr.	6 gr.	22 gr.	15 gr.	?	18 gr.	27 gr.	4 gr.	16 gr.	10 gr.	1/4 gr.	12 gr.	22 gr.
Portal of Entry:																					
Mouth	.....	+	+	+	+	+	+	.....	+	+	+	+	.....	+	+	+	+	+	+	+	.....
Skin	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Vagina	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Time after food (hrs.)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Emesis interval (min.)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Time before hospitalization	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Time in hospital (days)	90 dys.	2 dys.	6 hrs.	2 hrs.	1 hr.	2 hrs.	2 hrs.	12 dys.	1 hr.	1/2 hr.	4 hrs.	1 hr.	6 dys.	2 hrs.	2 hrs.	1 hr.	2 hrs.	2 hrs.	1 hr.	2 hrs.	11 dys.
Result	Death	Death	Well	Well	Well	Well	Well	Well	Well	Well	Death	Well	Well	Well	Well	Well	Well	Well	Well	Well	Death
Clinical Features:																					
Stomatitis	+++++	+++++	+	+++++	+++++	+	0	0	0	0	+++++	+++++	+	+	+	+++++	+++++	0	0	+	+++++
Vomiting	+	+	0	+	+	+	0	0	0	0	+	+	0	0	+	0	+	+	0	0	+
Hematemesis	+++++	+++++	0	+++++	+++++	0	0	0	0	0	+++++	+++++	+	+	+	0	+	+	+	+	+++++
Colon tenderness	+++++	+++++	0	+++++	+++++	0	0	0	0	0	+++++	+++++	+	+	+	+	+	+	+	+	+++++
Diarrhoea	+++++	+++++	0	+++++	+++++	0	0	0	0	0	+++++	+++++	+	+	+	+	+	+	+	+	+++++
Oliguria	+++++	+++++	0	+	0	0	0	0	0	0	+++++	+++++	0	0	+	0	0	0	0	0	+++++
Anuria	0	0	0	0	0	0	0	0	0	0	6 dys.	0	0	0	4 dys.	0	0	0	0	0	0
Blood pressure range	98-80	160-120	125	160-120	114	118	128	126	110-98	118	125-110	118	105	130	120-100	.....	95	.....	122	120-99	110-70
Pulse range	99-140	60-90	70-95	70-85	80-108	80-100	70-90	80-90	80-100	70-90	80-120	78-110	70-100	80-110	80-120	.....	80-100	.....	60-80	86-90	80-100
Temperature range	98-106	98-103	98-100	97-100	98-102	98-99	98-100	98-99.2	98-99.4	98-100	98-102	98-101	98-102	98-101	98-99.5	.....	98-99.5	98-99	98-100	98-99	94-96

Case Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Laboratory Findings:																					
Blood Wassermann.....	0	0	0	0	0	++++	0	0	0	++++	0	0	0	0	0	++++	0	0	0	0	0
Red Blood Cells (millions).....	18,400	3,250	4,940	2,900	3,180	.....	5,000	4,430	3,940	.....	3,120	.....	4,720	.....	2,040	4,700	3,420	4,660	4,640	3,620	3,420
White Blood Cells.....	70	12,220	9,550	20,600	13,200	.....	6,400	11,650	8,400	.....	32,650	.....	6,600	.....	20,000	17,500	12,000	8,000	5,000	8,100	15,000
P.M.N. Per Cent.....	70	79	73	91	89	.....	.....	67	54	.....	85	.....	.....	.....	83	.....	63	.....	.....	62	86
Hb.....	.....	64	92	61	65	.....	97	83	78	.....	61	.....	77	.....	73	88	85	75	75	77	75
N.P.N.....	120	177	37	189	38	.....	34	33	37	26	168	38	31	43	236	24	36	44	.....	30	293
Urea N.....	91	107	.....	96	21	11.2	12	14	14	13	117	12	.....	21	168	13	16	.....	.....	14	240
Uric Acid.....	.....	9	.....	2	3	.....	.....	5	5	4	8.5	.....	.....	10	3	4	.....	.....	.....	2.9	18.3
Creatinine.....	3.4	.....	.....	9.3	.....	.....	.....	.....	.....	.....	7.5	.....	.....	13	1.2	1.9	.....	.....	.....	.....	.....
Chlorides.....	.....	200	.....	265	390	.....	.....	.....	.....	.....	44	.....	.....	64	.....	.....	.....	.....	.....	.....	.....
CO ₂.....	.....	.....	.....	47	49	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	34
Urine albumin.....	+++	++++	0	++	+	0	0	+	+	++	++++	++	+	++	++++	+	++	0	0	+	+++
Casts.....	++	++++	0	+	0	0	0	+	0	0	++++	0	+	++	++++	0	0	0	0	0	++
Red blood cells.....	0	++	0	0	0	0	0	0	0	0	++	0	0	0	0	0	0	0	0	0	0
Sugar.....	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mercury, Stomach contents.....	.....	.....	+	+	0	+	+	.....	.....	+	0	.....	+	+	+	+	+	+	+	.....	.....
Stool.....	+	.....	+	+	0	.....	+	.....	.....	+	0	+	+	+	+	0	+	+	+	.....	.....
Urine.....	+	0	+	+	0	+	+	.....	.....	+	+	+	+	+	+	0	+	+	+	.....	.....
Bile.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0	0	+	.....	.....	.....
Treatment:																					
Gastric lavage.....	0	0	+	+	+	+	+	0	+	+	+	+	+	+	+	+	+	+	+	+	0
Colonic irrigation.....	+	0	+	+	+	+	+	0	+	+	+	+	+	+	+	+	+	+	+	+	+
Mouth wash.....	+	+	+	+	+	+	+	+	0	+	+	+	+	+	+	+	+	+	+	+	+
Duodenal irrigation.....	0	0	+	0	0	0	+	0	0	0	0	+	+	0	0	+	+	+	0	0	0
Biliary drainage.....	0	0	0	0	0	0	+	0	0	0	0	+	+	0	0	+	+	+	0	0	0
Venesection.....	0	0	0	4	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0
Transfusion.....	0	0	0	4	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0
Milk q2h.....	+	0	+	+	+	+	+	0	0	+	+	+	+	+	+	+	+	0	0	+	0
Hot Packs.....	0	+	0	+	0	0	0	0	0	0	+	0	0	0	+	0	0	0	0	0	0
I.V. Glucose.....	+	+	0	+	0	0	0	0	0	0	0	0	0	0	+	.....	+	0	0	+	+
" Saline.....	+	+	0	+	0	0	0	0	0	0	0	0	0	0	+	.....	+	0	0	+	0
" Fishers.....	0	0	0	+	+	0	0	0	0	0	0	0	0	0	+	.....	0	.....	0	0	0
Sod. thiosulphate, Mouth.	+	+	+	+	+	0	+	0	0	+	+	+	+	+	0	+	+	+	0	+	0
" intravenously	+	+	+	0	0	0	+	+	+	+	+	+	+	+	0	+	+	+	0	+	0

in the urine within 2 hours. Menten has demonstrated histological kidney changes in the rabbit as early as 5 minutes after administration of bichloride, and Johnstone and Keith have shown that these may be quite marked in 1 hour after the intravenous injection of novasurol. Excretion by the large bowel and salivary glands begins in from 6 to 12 hours. After single doses mercury continues to be excreted for some time. In case No. 15 mercury was found in the stomach washings for 13 and in the urine for 26 days.

Mercury bichloride in contact with tissue causes immediate coagulation and death of cells. A large quantity of the drug may so fix the mucosa that microscopically it appears normal though white and opaque to the naked eye. A small tablet may bring about ulceration in a localized area. Degenerative changes occur early at all sites of elimination, particularly in the kidney, liver, large bowel, mouth and pharynx. The changes brought about in the kidney are very characteristic and have been previously described. Many theories have been advanced as to the method of action, the generally accepted one being that there is a direct effect upon the cell. The intensity of the lesions found in the intestines, kidney, liver, etc., is not always the same. Any one organ may be picked out and damaged, according to the amount eliminated by that particular channel.

CLINICAL FEATURES

As the drug is swallowed the characteristic metallic taste is perceived, and at the same time or in a very few minutes a burning sensation is experienced in the pharynx, oesophagus and epigastrium. These symptoms are more pronounced if the mercurial has been in solution, but are usually present even when it is in the solid form. If bichloride of mercury has been ingested in any quantity the mucous membrane of the tongue and pharynx becomes coated with a grey film within a very few minutes.

Vomiting is the most common symptom, occurring in 17 of our patients. It begins in from two minutes to one-half hour after ingestion, and becomes frequent and distressing if large amounts of mercury have been taken, the vomitus often being bloodstained. All patients who showed evidence of toxicity had diarrhoea and stomatitis. The former begins within a few hours, the stools being liquid, bulky, extremely fetid, and later bloody. There is marked tenesmus, and soon the whole abdomen becomes tender and sore, especially along the course of the colon. Usually

by the third day, and occasionally within a few hours, salivation, stomatitis, glossitis and gingivitis occur. The tongue and buccal mucous membrane may become enormously swollen, causing embarrassment in speech, respiration and deglutition, and so interfering seriously with treatment. The breath is foul. The mouth symptoms vary greatly in severity, being usually more pronounced in cases of long duration. In case No. 1 there were extensive sloughs in the mouth, pharynx and vagina; in some patients death can be attributed to this factor.

The temperature varied with the severity of the illness, being normal in very mild cases and rarely above 38.8° C. in the severe ones. In case No. 1 the temperature reached 41.1° C. shortly before death, but this was due in part to secondary infection of the sloughing tissues. The blood pressures given in the table are the highest and lowest systolic readings during the hospital stay. They are a little lower than the readings one would expect in a corresponding group of normal individuals. Blood pressure tends to decrease with increase in toxicity. If absorption has taken place from the vagina severe local reaction may occur. In these patients local symptoms and those referable to the intestine occur first. Oliguria was present in 6 patients and anuria in 2. Patient No. 15 was anuric for four days and then recovered. If anuria develops it usually occurs within 72 hours and may last as long as 8 days with recovery. During the anuric period the patient may become drowsy and slight convulsive seizures may occur but typical uræmia is uncommon. Edema is rarely present. It was not seen in our patients. A scarlatiniform eruption may occur.

The very sick patients showed a gradual decrease in the number of red blood cells and in the percentage of hæmoglobin. Except in those with little toxicity, a leucocytosis occurred, varying from 9,000 to 32,650. There was a corresponding increase in the polymorphonuclear elements, which reached as high as 91 per cent. When considerable absorption of mercury had taken place there was a rapid rise in the non-protein nitrogen constituents of the blood. A definite elevation occurred by the third day and within 14 days this had usually reached its maximum or the patient had succumbed. These amounts may reach very high levels and yet recovery occur. The highest figures obtained in our series were in patient No. 21, who died 12 days after a single bichloride vaginal douche. At the time of

death the non-protein nitrogen was 293 mg., the urea-nitrogen 240 mg., and the uric acid 18.3 mg. per cent. In patient No. 1, who also died, the non-protein nitrogen did not rise above 120 mg. per cent. Patient No. 15 recovered, even though the non-protein nitrogen reached 236 mg., the urea nitrogen 168 mg., the uric acid 10 mg. and the creatinine 13 mg. per 100 c.c. blood. When there is this amount of retention in nephritis, recovery does not occur, and this suggests some additional causative factor in mercury poisoning. The blood chlorides are usually low, as in 3 of our patients and in 4 of the 5 patients in whom determinations were made the carbon dioxide combining power of the blood decreased with increase in the degree of toxicity. The phthalein excretion rapidly falls to zero in the very sick patients and gradually returns to normal with recovery.

Glycosuria is not uncommon, although it was not found in our patients. Hyperglycemia does not occur. Albumin was present in the urine of 16 patients and the amount usually varies with the severity of the general symptoms. Casts were reported in 9 instances and red blood cells in 2.

DIAGNOSIS

The diagnosis is usually easy from the history and clinical examination. It is readily confirmed in a few hours by examination of the stomach contents and excreta. Patient No. 1 was suspected of having Vincent's angina until examination of the blood revealed a high non-protein nitrogen, and the urine showed the presence of mercury. In this group the stomach contents were examined in 16 patients and 11 gave positive reactions for mercury. The stools were also examined in 16 with 11 positive results. The urine was tested in 17 patients with 13 positive results. The bile was examined in 5 with 3 positive results. From a study of the records it is felt that negative findings were due to insufficient or unsatisfactory specimens. Certain patients who give the history of having taken poison should be treated intensively until the information is proved false.

PROGNOSIS

The prognosis depends largely on the amount of mercury that has been absorbed and the susceptibility of the patient. The mortality in this series was 14.3 per cent. Two deaths followed bichloride vaginal douches. A third patient died 14 days after taking 15 grains of mercury bichloride by mouth, treatment having

been delayed two days. The fourth death followed 7 days after the ingestion of 22 grains of corrosive sublimate, treatment having been started four hours after the drug was taken. Patient Nos. 4 and 15 were critically ill for several days, but finally recovered. In a group of 135 consecutive patients, taking from 15 grains to 60 grains, Weiss reports a mortality of 6 per cent; Witthaus from a series of 745 patients gives the mortality as 55.1 per cent. More recent results from Cook County Hospital give a mortality of 15.5 per cent.

If death results from a single dose, it is usually due to renal insufficiency and takes place in from 5 to 14 days. Death as early as 3 hours and as late as 41 days following a single dose has been reported. In animals a massive intravenous dose causes immediate death, while with a smaller lethal dose the length of life is largely proportional to the size of the dose. Occasionally death is due to a severe colitis, vaginitis, or stomatitis. Liver degeneration is also a factor in bringing about death. If the patient recovers it is believed that he does so completely, without appreciable scars to interfere later with his health.

TREATMENT

An early start is the important feature in treatment, and efforts should be chiefly directed towards prevention of absorption. In spite of the long list of drugs that have been brought forward as of value in the treatment of mercury poisoning, it has not been established that we have any effective antidote after the metal has reached the circulation. One of the most recent of such substances introduced for this purpose is strontium thioacetate. This in turn has been shown to be without value in experimental work on animals. Various therapeutic procedures have been advocated from time to time as being almost specific for mercury poisoning. Forced fluid administration, alkali therapy, exsanguination-transfusion, intravenous glucose, intravenous saline solution, and decapsulation of the kidney have each been brought forward as being highly useful. In dogs none of these measures have of themselves proved capable of even lengthening life. This does not mean that one or more of such procedures cannot be used to advantage in conjunction with other measures, for if the patient's general condition can be supported until the bulk of the mercury is excreted he may stand a chance of recovering, owing to the natural ability of the damaged organs to regenerate.

Without doubt, our most valuable method of treatment is the mechanical removal of the poison, as once a lethal dose has entered the circulation our chances for saving life are small. Because of the rapidity of absorption, treatment carried out within the first few minutes will be much more effective than if delayed several hours. Before the physician arrives nature has usually played an important part, in that repeated vomiting has already removed a considerable portion of the drug. In addition, in the majority of cases friends have given protein in the form of eggs and milk. If this has already been done, the stomach should be immediately washed out with a saturated solution of sodium bicarbonate, at least two quarts being used until it is returned clear. By the time the average patient reaches the hospital a considerable portion of the drug will have passed into the small intestine and even though a strong cathartic is given after the gastric lavage, several hours may elapse before a thorough evacuation of the bowels occurs. Such a delay allows still more mercury to enter the circulation. This added absorption may be avoided if immediately after the gastric lavage a duodenal tube is passed and transduodenal irrigation carried out. This is done by passing slowly down the tube a warm saturated solution of sodium bicarbonate until the patient expresses a desire to defæcate. This usually occurs after one or two quarts have been given. In this way, the whole intestine is washed out, removing at once that portion of the drug which has left the stomach. One ounce of a saturated solution of magnesium sulphate should be left in the duodenum before withdrawing the tube.

The patient is now placed on bed rest and given a high carbohydrate, maintenance protein, low salt diet. Six ounces of milk, alternating with two ounces of lactose in six ounces of fruit juice, are given every two hours. Extra carbohydrate is readily supplied in this way, and the protein in the milk is constantly available to form an insoluble mercury proteinate with the metal being excreted into the gastro-intestinal tract. The value of glucose in sparing the liver and kidney in toxic conditions and its usefulness in mercury poisoning is supported experimentally. A careful record is kept of the fluid intake and every effort made to give at least 5,000 c.c. each 24 hours. A difference of opinion exists as to the advisability of giving large amounts of fluid. The majority of writers stress the importance of forced fluid administration in hastening the

elimination of mercury. Haskell has recently questioned its value and even considers that it may be harmful. However, not only does the bulk of evidence appear to be in its favour but also it seems a rational procedure, unless there is a specific contraindication, such as a damaged heart.

Within a few hours after ingestion the salivary glands, gastric mucosa, and large intestine begin to excrete mercury. If reabsorption is to be prevented repeated lavage of these areas is important. A mouth wash, consisting preferably of a saturated solution of sodium thiosulphate, should be used frequently, and the stomach and colon irrigated twice a day. Anderson goes so far as to advise cæcostomy and continuous irrigation of the large bowel. It would seem that such a procedure should be reserved for those occasional cases where the colitis overshadows the general picture of mercury poisoning. In spite of the frequent washing of the mouth and stomach at least some mercury is constantly entering the small intestine for reabsorption. In addition, by the second day the mercury excreted by the liver in the bile will be available to return to the circulation. In our later patients, gastric lavage was carried out with a duodenal tube at least once daily. The tube was then allowed to pass into the duodenum and transduodenal irrigation carried out. While the tube was still in place, using an ounce of a saturated solution of magnesium sulphate as a stimulant, biliary drainage was done for several hours until 500 c.c. to 600 c.c. of bile were drawn off. It was hoped in this way to prevent some reabsorption.

If the patient has been seen early, such treatment in many cases will have prevented entry to the circulation of mercury in sufficient quantities to cause severe symptoms. However, if oliguria and anuria threaten, hot packs may prove beneficial. With increasing toxicity, the food and fluid intake is apt to become low. It then becomes important to give fluids parenterally and with these enough glucose can be incorporated to maintain the carbohydrate intake. In the toxic patients a fall in blood chlorides is common and the importance of maintaining them at their normal level has been recently stressed. This can be done by giving the fluid as glucose saline solution. MacNider has contended that the kidney damage is brought about largely by an acid intoxication. Many severe cases develop an acidosis and because of this alkalies have been advocated. There is considerable contra-

dictory evidence as to their value. Some writers consider them distinctly harmful and experimental evidence does not support their usefulness.

Robertson has shown that exsanguination-transfusion is of value in various toxic conditions, especially burns in children. That fairly large amounts of mercury remain in the circulation has been shown by Rosenbloom. The removal of large amounts of blood followed by transfusion has been advocated in mercury poisoning, but experimental work has failed to support this procedure. This measure was repeatedly carried out in patients Nos. 4 and 15 and they seemed to derive distinct benefit from its use. Whether enough mercury is removed to justify large venesections is doubtful; however, certain patients become quite anæmic on account of the toxic action of the metal as well as the loss of blood from the mouth, stomach and bowel, and in such transfusion seems definitely indicated.

We use sodium thiosulphate, both by mouth and intravenously. Its intravenous use has not proved valuable in experimental animals although it has been shown to be harmless. In the test tube this drug reacts with mercury bichloride to form insoluble compounds and on this basis it seems reasonable to use it by mouth. In certain types of arsenic poisoning sodium thiosulphate is considered almost a specific, and certain writers consider it of value in poisoning by mercury. We shall continue to use it until a more specific antidote is discovered.

None of our patients were operated upon for decapsulation of the kidney. Theoretically, this procedure might offer some help in anuria. The

results reported are contradictory. Decapsulation should be reserved as an extreme measure. Knowing that patients have recovered after an anuria of eight days' duration without decapsulation, recovery should not be too readily attributed to this operation.

Intensive therapy should be carried out as long as appreciable excretion of mercury occurs. The variety of antidotes recommended and therapeutic procedures advised are indication enough that we have as yet found no specific method of therapy for mercury poisoning. Until such a method is discovered, we shall have performed the maximum service for the patient if we do everything at our command to prevent the drug from entering the circulation, and at the same time administer general treatment such as we would use in any other toxic condition.

SUMMARY

1. Twenty-one consecutive patients with acute mercury poisoning are reported, and with these as a basis, the main clinical and pathological features of this condition are discussed.
2. Treatment in the light of recent experimental work is outlined.
3. In view of the fact that at present prevention of absorption is more effective than any known therapeutic measure, transduodenal irrigation and biliary drainage are suggested as additional means of achieving this result.

(Note.—A very comprehensive bibliography accompanied this paper but has been omitted for lack of space. Information regarding the literature can be obtained from Dr. Johnstone direct.)

THE CORTICAL HORMONE IN ADDISON'S DISEASE.—

J. M. Berkman and J. Lansbury each report a case of Addison's disease, in both of which beneficial results followed treatment with the cortical hormone of Swingle and Pfiffner. The diagnosis in the first case was made owing to marked progressive weakness, loss of weight, gastro-intestinal disturbance, hypotension, and pigmentation. A subcutaneous injection of 10 c.cm. of the hormone was given, and a modified Muirhead regimen instituted. After two days' improvement a relapse threatened. Since no more hormone was available, physiological saline solution was injected intravenously, and the regimen was continued. The patient once more improved, but loss of weight persisted. With the advent of more hormone, this was again administered. Definite improvement ensued and has continued. The second patient suffered from dyspnea, loss of weight, and dizziness, and extreme fatigue and palpitation on the slightest exertion; the marked pigmentation characteristic of Addison's disease was present. Treatment with the hormone was commenced, and 86 c.cm. was given in five days, all

but 7 c.cm. being administered intravenously. Little change was noted for two days, but then improvement was shown, the patient's colour becoming much more normal; with the exception of headache, she was feeling well and strong at the time of the report. L. G. Rowntree, also of the Mayo Clinic, states that the results in these cases are typical of those obtained in a group of 7 similarly treated. The treatment is usually effective in five days; the appetite and weight increase, and definite euphoria is experienced. Changes in blood pressure and in the amount of pigmentation follow much more slowly than the relief of gastro-intestinal disturbances. However, these results must be regarded as being temporary, immediate, and due to substitution. Patients with Addison's disease suffer from shock in even very minor operations, and it is hoped that this treatment will be an effective pre-operative measure, as is iodine in hyperthyroidism. The results of these preliminary studies seem to indicate that this hormone is a specific for Addison's disease; if so, the therapeutic response to the hormone affords a new test for this disease.—*Proc. Staff Meetings, Mayo Clinic, Oct. 15, 1930, p. 292.*

THE MANAGEMENT OF PLACENTA PRÆVIA*

BY PRESLEY A. MCLEOD, M.D.,

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THE management of placenta prævia aims at a safe delivery. To accomplish this one must control hæmorrhage, combat shock, prevent infection, and empty the uterus in the safest manner possible, all of which procedures will vary according to the conditions met with in the individual case.

If one were to adopt a motto for the management of these cases it might well be that of the Boy Scouts, "Be Prepared." This may sound rather inapt to apply to cases of placenta prævia, especially when one sometimes does not see them until they are perhaps partially exsanguinated, in shock, and potentially infected. However, many are seen at the commencement of bleeding. It is in those which are bleeding slightly, or which have been bleeding and have stopped, that one might apply what may be termed prophylactic treatment. If during the last few months of pregnancy the patient complains of painless bleeding, placenta prævia is suspected. While it would be an easy matter to make a digital examination to confirm the diagnosis, better management would not permit this to be done until preparations had been made to handle the case should the examination start up again or increase the bleeding. It is so easy to dislodge a blood clot or open up a new sinus and cause serious hæmorrhage. It is better to postpone this examination, when possible, until the case is in the delivery room, with packing ready and instruments to insert it if necessary, with bags and sterile solution at hand, and, if possible, also, a donor, typed and ready to give blood, should this be deemed advisable. If one wished to go a step further, the operation room may be set up for a Cæsarean section. In all cases this is not possible and for those patients who are bleeding severely, tamponnade under the best conditions available should be done.

All cases should be dealt with in hospital if at all possible. They require so much to be done

in such a short time that it is not fair to the patient nor to the accoucheur to attempt to deal with them without all possible facilities being available. It is obvious that those patients who have been under one's own observation, or who have been attending an ante-natal clinic and can be placed in hospital at once, are in a more favourable position than those who are seen late. In hospital it should take but little longer to give a blood transfusion than an intravenous infusion. All hospitals should have, and most do have, someone available at all times who is capable of typing blood and of giving a blood transfusion, preferably by one of the direct methods, that is, the Unger, Scannell or direct syringe method. While ordinarily the laboratory technician may do the blood grouping, as many of these cases occur at night and demand immediate attention, it is necessary that someone be on call who is capable and familiar with the apparatus for doing this work. This will save valuable time.

It is good routine to anticipate shock. If serious bleeding has occurred, a transfusion should be given. Otherwise, when the patient is ready for delivery, a donor should be at hand, the necessary apparatus sterilized, and sufficient help available. Then if free bleeding occurs during delivery, the donor is brought into the room and a transfusion commenced. One should not wait for the patient to show signs of shock, but when bleeding is excessive transfusion should be started at the earliest opportunity.

Emergency treatment of shock will include an intravenous infusion and here gum-glucose has a place. A solution containing 6 per cent gum acacia, which is specially selected, and 20 per cent glucose, sustains the blood pressure for a longer period and is absorbed more slowly than if glucose alone were used. From 400 to 1,000 c.c. of this solution are given at a rate of from 4 to 6 c.c. per minute, at a temperature of 105 degrees. Many theories have been advanced to describe shock and many methods of treatment

* Read before the Section of Obstetrics and Gynaecology, Academy of Medicine, Toronto, December 4, 1930.

advised, but two of the most universal methods of treatment are blood transfusion and the intravenous injection of glucose. To prevent infection, one hardly need mention that strict asepsis and careful technique must be observed throughout and vaginal examinations limited. It is necessary that at least one vaginal examination be performed to establish the diagnosis and the type of placenta prævia. These examinations must be done with the utmost care and gentleness.

The method of emptying the uterus will vary according to the conditions encountered. It will depend somewhat on the condition of the mother and fetus, but chiefly on the type of placenta prævia and the condition of the cervix, *i.e.*, its degree of dilatation and its dilatability. In all cases, with the exception, perhaps, when there is a slight marginal insertion, it is unwise to temporize, as one hæmorrhage generally promises another which may be more severe. The marginal type, especially if in a multipara, is usually the simplest to manage. Often it is necessary only to rupture the membranes to allow the head to engage. The head may then act as a tampon and labour proceed normally.

The management of the more severe marginal and of the less severe partial is usually the same. Many advocate Braxton Hicks' version. Personally, I prefer the introduction of a bag, and for inducing labour in these two types of placenta prævia, with dilatable cervix, the Voorhees bag has many advantages. As the bag is cone-shaped and filled with fluid, it forms a true hydrostatic wedge, fits the cervix, accomplishes a fairly rapid dilatation and at the same time acts as a tampon to control bleeding. Some favour placing the bag on top of the placenta after puncture of the membranes, but the extra-ovular insertion, in the cervix under the placenta, is generally quite satisfactory. Usually there is sufficient dilatation of the cervix to permit insertion of the bag without difficulty and it is a simple matter to fill it with fluid. One should inject the fluid slowly in order not to stretch too rapidly the lower uterine segment. Ordinarily, it is not necessary to apply any traction, but if bleeding continues slight traction may be applied to the tube of the bag. Mercurochrome, 4 per cent, may be injected into the vagina from time to time to render the area more aseptic.

The progress of labour must be carefully watched and the pushing of the bag through the cervix carefully followed. The latter may be determined by rectal examination, and it is possible to determine whether the bag is fixed in the cervix or about to slip out, especially if the examination be done during a uterine contraction. It is possible and necessary to keep a step ahead of the condition. If a small bag was at first inserted, all preparations for inserting a larger must be complete before the smaller comes out. It is well in the first instance to insert as large a bag as possible, preferably a No. 5, then when it comes out the patient is ready for delivery. It is necessary to watch the patient most carefully, as once the bag is expelled, bleeding will recur in greater force. With the patient prepared and everything in readiness the bag is pulled on gently until it slips through the cervix, then either a larger one is inserted or the patient delivered. No matter which of these is done, the most valuable element in the situation at this point is time. As manual dilatation is contraindicated before delivery is attempted, the cervix must be dilated sufficiently for the hand to enter the uterus.

Version and extraction is the method of choice for delivery. Version is not only the most rapid method of delivery but causes the baby to act as a tampon to control bleeding. After a foot has been brought down, the thigh and buttock check the bleeding to a great extent. Then, as delivery progresses, the trunk, shoulders and head are brought against the bleeding area and pressure is maintained on the sinuses until the head is delivered. A slow breech extraction is important. Only in those cases in which the bleeding is not controlled is speed necessary. If the buttock controls the bleeding, then it is best to proceed slowly. Often the cervix has not reached full dilatation; a slow extraction will complete this and leave the cervix so open that it will not obstruct the after coming head. Moreover, that portion of the cervix to which the placenta has been attached is soft and friable and contains many large sinuses. A hasty extraction may tear rather than dilate such a cervix and the resulting hæmorrhage may be serious.

The management of the third stage is quite important, as post-partum hæmorrhage is not rare. The lower uterine segment has poor con-

tractile power at all times, and the more blood a patient loses, the lower the muscle tone, and the less the ability of the uterus itself to remain contracted.

The routine followed after delivery of the baby has been to immediately remove the placenta manually, to pack the uterus, cervix and vagina with gauze, at the same time giving pituitrin and ergot hypodermically. After the placenta has been removed, one should make a careful inspection to determine if there is any free bleeding and if there is, to determine whether the blood comes from the uterus or cervix. Profuse bleeding may result from a lacerated cervix and repair should be done without delay. As the cervix is so thinned out, so large in diameter, and often folded on itself, it may be difficult to expose properly, even after retraction of the vaginal walls. A satisfactory method of obtaining good exposure is to grasp the cervix firmly with sponge holders, being careful not to clamp them too tightly, and bring down and expose part at a time. These sponge forceps have not the same tendency to tear the cervix as tenacula have, but tend rather to control bleeding. One sponge holder grasps the cervix firmly, another grasps it about two inches from the first, and a third is placed about two inches from the second. In this way at least three inches at a time are exposed and brought down somewhat into view. This is repeated by shifting the forceps on the cervix until it has been completely inspected. If there is a laceration, with this exposure repair may be done easily and quickly. Forty-day chromic catgut is to be preferred for this work. If desired, the uterus may be packed before inspection and repair of the cervix is done.

Whether there is or is not bleeding from the uterus, it is well to pack the uterus, cervix and vagina with gauze, preferably iodoform gauze. All three should be packed firmly—not with two or three yards of gauze but with enough to exert firm pressure on the sinuses of the cervix, both from within the uterus and from the vagina. The object of the packing is, of course, to control hæmorrhage, but it sometimes has another use of minor importance. As one is usually in a hurry when removing the placenta

manually, all of it may not be completely taken away. The gauze tends to collect any tags left behind and bring them out when it is removed.

One need not hesitate to use the bag in cases of marginal or slight partial placenta prævia which have a dilated or dilatable cervix. If, however, the placenta prævia be a complete or severe partial one, or if a lesser degree of partial in a primipara, with firm, almost closed cervix, which will not dilate readily, then Cæsarean section is preferable. In all clean cases of complete, in cases of the more severe partial, and in cases of partial with firm cervix, Cæsarean section is perhaps the most conservative method of delivery. It is the method of choice when the fetus is viable and the mother at or near term, and desirous of a living child. It may be considered for the sake of the mother even though the fetus be not viable. On account of the situation of the placenta the classical operation is usually recommended, but the low flap operation may be done, particularly in cases of the complete type.

The management of the third stage in these cases is similar to that previously mentioned. The placenta is removed manually, the uterus packed with gauze via the abdominal incision, and pituitrin and ergot given by hypodermic injection. Before the uterus is closed, careful inspection should be made for signs of bleeding, and if, after giving pituitrin and ergot and packing the uterus, the hæmorrhage is still free, hysterectomy must be considered. In my humble opinion there may be too much hesitation about doing a hysterectomy in those cases which continue to bleed, and I have seen a few deaths in cases of placenta prævia result from hæmorrhage after Cæsarean section. The patients kept on losing blood, not in gushes but oozing and dribbling, the accoucheur thinking the bleeding would stop, and not realizing that the patient was bleeding to death until too late. On the other hand one does hesitate to remove the uterus if it is thought that the bleeding may be checked by other measures. It requires very careful judgment to decide just when one should resort to hysterectomy. Cæsarean section is, however, rapidly gaining favour, as the method of delivery in these types of placenta prævia.

SUGAR TOLERANCE CURVES IN ACUTE INTOXICATION OF INFANTS*

BY T. G. H. DRAKE AND CHARLES E. SNELLING,

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SOME years ago Drs. Tisdall, Drake and

Brown¹ reported the marked abnormality in the carbohydrate metabolism of infants suffering from acute intestinal intoxication. If they injected glucose intravenously into these infants they found that it was removed less rapidly from the blood stream than in the case of normal infants. In other words the sugar tolerance curves were high and broad, very much like those of diabetic patients. The following report confirms the above findings, and in addition shows an absolute correlation between the intensity of the intoxication and the increase in height and width of the sugar tolerance curve.

LITERATURE

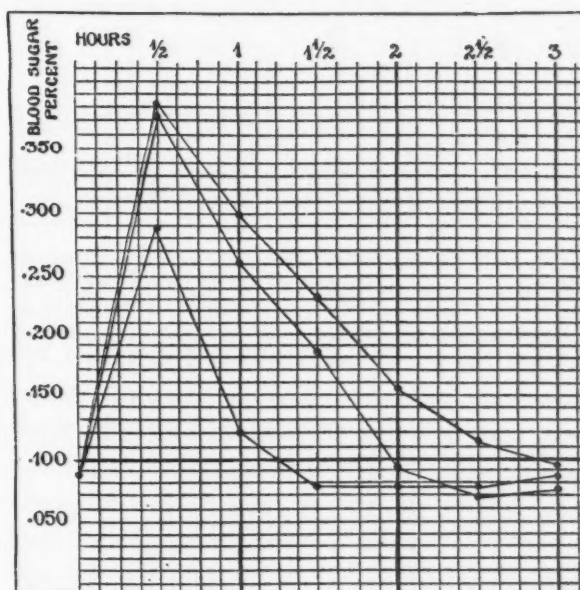
Fedynski² and his co-workers have reported similar results after the intramuscular injections of glucose. They determined the sugar tolerance curves of dyspeptic infants also, and found that they were similar to those of normal infants. In other words the normal and dyspeptic infants showed lower blood sugar levels after injection of glucose than the acute intestinal intoxication cases. None of their patients had blood sugar readings over 0.200 mg. per 100 c.c. Mogowitz³ and Niemann⁴ also reported a tendency to hyperglycemia in acute intestinal intoxication. These workers were thus unable to confirm an earlier report of Cobliner⁵ who found normal blood sugar values in this condition. An interesting contrast to our results is provided by McLean and Sullivan's⁶ finding in coeliac disease. In this condition, which is characterized by excessive fermentation in the gastrointestinal tract, the sugar tolerance curves are much lower and flatter than normal.

METHOD

The method used was as follows. Ten c.c. of 10 per cent glucose solution per pound of body

weight was injected into the superior longitudinal sinus. Blood was taken before and half an hour, 1 hour, 2 hours and 3 hours after the injection for the determination of the blood sugar. Folin's method was used. This was repeated every second or third day until the infant recovered or died. Daily records of the clinical condition of the patient were also kept. Infants showing varying degrees of toxicity on admission were chosen, and all were taken from the group in which we could find no cause parenterally for the condition, although a few developed upper respiratory infections subsequently. These cases were all treated by transfusion, hypodermoclysis, intravenous glucose and 15 per cent sugar solution by mouth.

CHART A



The upper line represents the average sugar tolerance curve obtained after the intravenous administration of 10 c.c. per pound of body weight of a 10 per cent solution of glucose to infants with acute intestinal intoxication. The middle line is the average curve obtained with infants with infection and the lower line the curve obtained with normal infants.

Drs. Tisdall, Drake and Brown¹ state that the average blood sugar in normal infants is 0.09 mg. per 100 c.c. Half an hour after an injection of 10 c.c. of a 10 per cent solution of glucose per pound of body weight it rises to 0.285

* From the wards of the Hospital for Sick Children and the laboratories of the Sub-department of Paediatrics, University of Toronto, under the direction of Alan Brown, M.B.

mg. per 100 c.c., and it returns to the 0.09 mg. level one and one-half hours after the administration of the glucose. They found that cases of acute intestinal intoxication who had been given the same injection showed a blood sugar of 0.375 mg. per 100 c.c. in half an hour, and this did not return to the 0.09 mg. level until three hours had elapsed. The correlation between the degree of toxicity of the patient and the increase in the height and width of the sugar tolerance curves is shown graphically in the following charts.

CASE 1

History.—Diarrhoea, 2 weeks; vomiting 1 week; drowsiness 3 days. Physical examination showed a well-nourished slightly dehydrated, mildly toxic infant. The liver was palpable at the costal margin. The child became much more toxic, and the dehydration increased in spite of treatment. The liver enlarged to 4 cm. below the costal margin and the child died 8 days after admission. A post-mortem examination showed marked fatty infiltration of the liver and nephrosis.

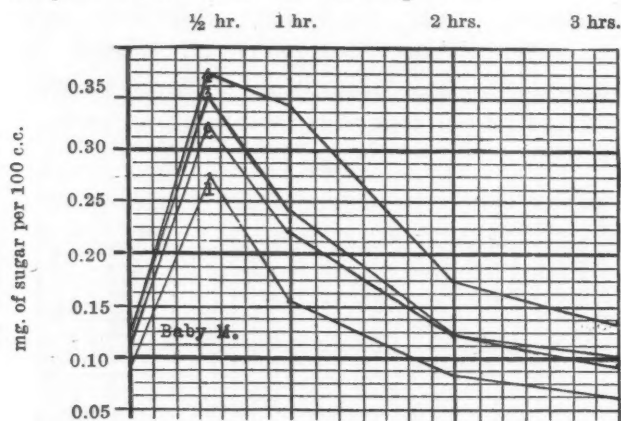


CHART I.—Case 1. The curves shown are estimations of the blood sugar made before ½ hr., 1, 2, and 3 hrs. after the injection of 10 c.c. per pound of 10 per cent glucose intravenously. No. 1 is on admission; No. 2, No. 3 and No. 4 at intervals of 2 to 3 days later.

The sugar tolerance curves as shown in Chart I.—At first, 1 is low and almost normal. With the increase in toxicity the curves 2, 3, and 4 become higher and do not come back to the base line so soon, showing that the glucose is removed slowly. The child died 10 hours after the last determination.

CASE 2

History.—Diarrhoea 2 weeks; vomiting 1 day; drowsiness 1 day. On admission, the child was mildly drowsy and toxic, slightly dehydrated and poorly nourished. The liver was palpable 1 cm. below the costal margin. In 3 days' time the toxæmia disappeared.

The glucose tolerance curve (Chart II) on admission is only slightly raised and is the exact reproduction of 1 in Chart I. The second determination (2) two days later shows a normal curve.

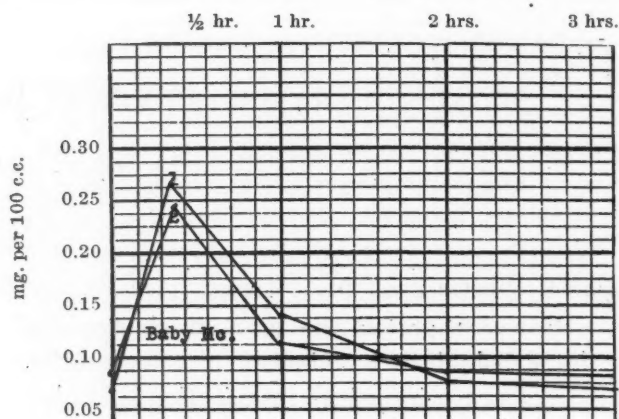


CHART II.—Case 2. The curves shown are estimations of the blood sugar made before ½ hr., 1, 2, and 3 hrs. after the injection of 10 c.c. per pound of 10 per cent glucose intravenously. No. 1 is on admission; No. 2, 2 days later.

CASE 3

History.—Diarrhoea, vomiting and drowsiness for 3 days. Physical examination showed a mildly toxic child, very poorly nourished, moderately dehydrated, with the liver edge at the costal margin. This baby steadily improved and in 3 days' time showed no evidence of toxæmia or drowsiness.

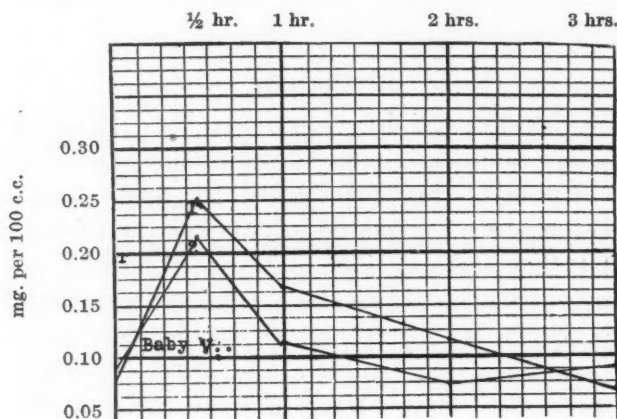


CHART III.—Case 3. The curves shown are estimations of the blood sugar made before ½ hr., 1, 2, and 3 hrs. after injection of 10 c.c. per pound of 10 per cent glucose intravenously. No. 1 is on admission; No. 2, 2 days later.

The glucose tolerance curve (Chart III) shows a rather flat long drawn out curve which did not come down to normal at 2 hours. Curve 2, two days later, is the sharp normal curve, down to normal after 1½ hours.

CASE 4

History.—Vomiting, diarrhoea and drowsiness, 1 day. On admission, the child showed marked drowsiness and toxæmia, marked dehydration, very poor state of nutrition, and the liver border was 1 cm. below the costal margin. The child improved rapidly for 1 week and then had a slight return of the toxicity, along with 5 to 7 stools and vomiting 3 to 4 times for 2 days. After this the child improved rapidly.

The sequence of glucose tolerance curves (Chart IV) in this case is very interesting.

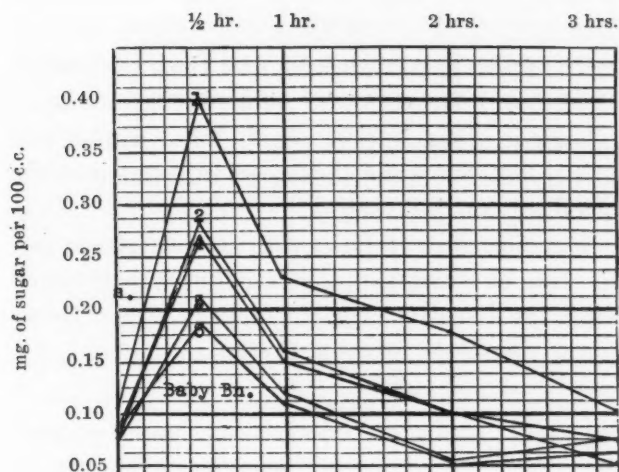


CHART IV.—Case 4. The curves shown are estimations of the blood sugar made before $\frac{1}{2}$ hr., 1, 2, and 3 hrs. after injection of 10 c.c. per pound of 10 per cent glucose intravenously. No. 1 is taken on admission; No. 2, two days later; No. 3, five days after admission; No. 4, seven days after admission; No. 5, eleven days after admission.

Curve 1 is high and long drawn out, coming to normal at 3 hours. Curve 2, two days after admission, shows marked improvement, but it is still slightly above normal, coming down at 2 hours. Curve 3, five days after admission, is normal. Curve 4, seven days after admission, during the return of the toxæmia, is high again and requires 2 hours to come down to the original blood sugar level, and curve 5 taken 11 days after admission, when the child was bright and taking feedings, is a sharp, low curve.

CASE 5

History.—Pallor and sunken eyes for 4 days; greenish, loose, frequent stools for 6 days; vomiting, 3 days; drowsiness 2 days. On admission, the child was very toxic and drowsy, and was moderately dehydrated. The liver was palpable 3 cm. down and the nutrition

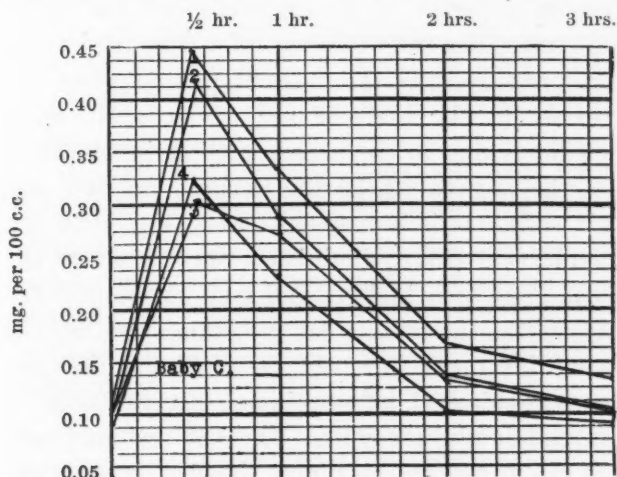


CHART V.—Case 5. The curves shown are estimations of the blood sugar made before $\frac{1}{2}$ hr., 1, 2, and 3 hrs. after injection of 10 c.c. per pound of 10 per cent glucose intravenously. No. 1 is on admission; No. 2, No. 3 and No. 4 at 2 day intervals.

was good. The toxæmia and drowsiness improved definitely but did not disappear. The child developed broncho-pneumonia on the 6th day and died 8 days after admission. A post-mortem examination showed fatty infiltration of the liver, broncho-pneumonia and nephrosis.

The glucose tolerance curves (Chart V) show on admission a very high, broad, slowly descending curve, not coming down to normal even at the end of 3 hours. The others at 2 day intervals are successively lower and come to the normal level more rapidly, but none come down to the base line in less than 2 hours.

CASE 6

History.—Vomiting, diarrhœa, loss of weight, for 3 days; drowsiness for 2 days. On admission, the child showed marked toxæmia and slight dehydration. The liver was palpable 3 cm. below the costal margin. The general nutrition was very good. The toxæmia in this child improved slightly, but the dehydration became more

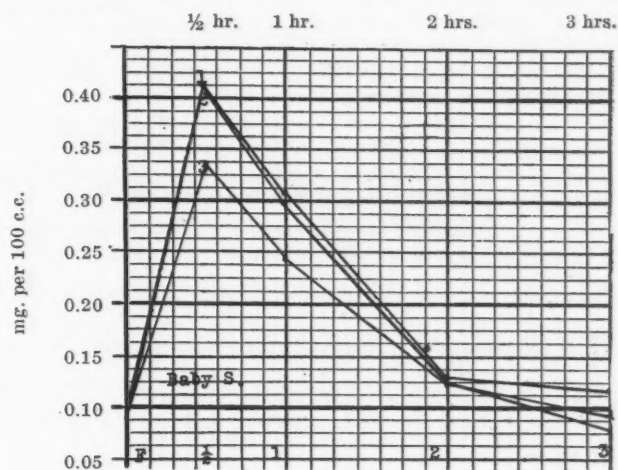


CHART VI.—Case 6. The curves shown are estimations of the blood sugar made before $\frac{1}{2}$ hr., 1, 2, and 3 hrs. after injection of 10 c.c. per pound of 10 per cent glucose intravenously. No. 1 is taken on admission; No. 2 and No. 3 at 2 and 3 day intervals.

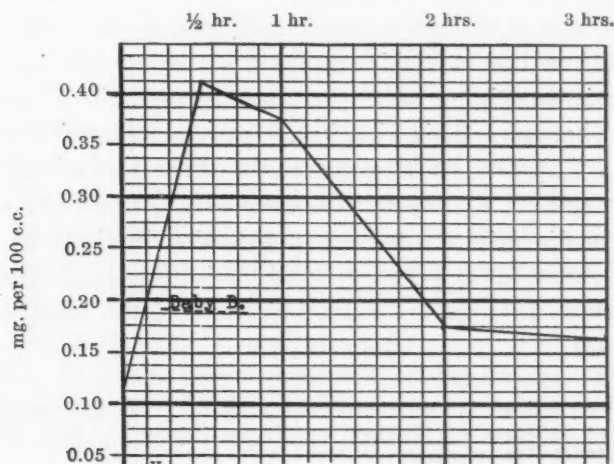


CHART VII.—Case 7. The curves shown are estimations of the blood sugar made before $\frac{1}{2}$ hr., 1, 2, and 3 hrs. after injection of 10 c.c. per pound of 10 per cent glucose intravenously. Only one determination was made on this case; death followed shortly after.

marked. The child died suddenly seven days after admission. A post-mortem examination showed definite fatty infiltration of the liver and nephrosis.

The glucose tolerance curves (Chart VI) in this case are all practically the same. They are spread out curves, above normal for 3 hours.

CASE 7

History.—Vomiting, diarrhoea and drowsiness for 6 days. The child was acutely ill, markedly dehydrated and very drowsy. The liver was palpable 2 cm. below the costal margin. The nutrition was good. The patient did not improve and died thirty-six hours after admission. This child was the most toxic of the group. A post-mortem examination showed fatty degeneration of the liver and nephrosis.

Only one determination was made in this case. The curve (Chart VII) is extremely high and broad, and does not approach the base line even in 3 hours' time. The child died 18 hours later.

SUMMARY

The findings recorded confirm those of Tisdall, Drake and Brown, who showed that in acute intestinal intoxication cases the ability to utilize glucose which has been injected into the blood stream is lessened.

Furthermore, it has been demonstrated that the rate at which the injected glucose is removed from the blood stream is inversely proportional to the degree of toxæmia present.

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THE DIAGNOSIS OF MASTOIDITIS IN CHILDREN*

BY D. E. S. WISHART, M.B.,

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THIS paper is a simple and elementary review of a well known subject. It is presented in the hope that it will provoke considerable discussion.†

ANATOMY

The middle ear cleft is developed from the nasopharynx. A hollow bud of mucosa grows backward and outward into the temporal bone. From it is formed the mastoid antrum and cells. Thus the mastoid antrum and cells make one air-containing space continuous with the nasopharynx. This idea is not purely an academic conception, as corrosion casts of the left middle ear cleft will show. Consequently, just as otitis media originates from an infection in the nasopharynx, so acute mastoiditis is nearly always secondary to an acute infection of the middle ear.

* Read before the Canadian Society for the Study of Diseases of Children on Friday, June 20, 1930, at Brockville, Ontario.

From the Laryngological Service, Hospital for Sick Children, Toronto.

† The author began by the exhibition of pictures and diagrams illustrating the anatomy and pathology of the temporal bone.

PATHOGENESIS

In most acute suppurative inflammations of the middle ear there is involvement to some extent of the mastoid antrum. In its beginning the involvement is confined to the lining mucosa. The latter becomes engorged and swollen. This causes obstruction of the aditus or of the entrances to the chains of cells. The subsequent course depends on the quantity and quality of the infection thus blocked off. The tenderness on pressure over the mastoid process often observed in the early stages of an acute otitis media is due to the accompanying involvement of the mucosa lining the mastoid antrum and air cells. It is a common observation that this tenderness often diminishes shortly after the drum has been incised, and may completely disappear as the middle ear infection subsides. In some instances, however, the infection that has become blocked off continues. It proceeds to extend in the air cells. These it distends and, as the pressure continues, the fine bony septa are broken down and adjacent cells invaded. The direction of the invasion depends on the position of the group of cells infected. As a

rule the chains of cells extend to the cortex over the external surface of the mastoid. The outer table is perforated in the same way, leading to the formation of the usual post-aural abscess.

The chain of infected cells may, however, extend to other portions of the surface: (1) to the zygomatic or temporal area; (2) to the occipital area; or (3) to the cervical area.

The suppurative process in the mastoid tip may perforate the internal face of the tip and give rise to an abscess of the neck situated beneath the sterno-mastoid muscle. The diagnostic signs are—swelling in the cervical region, limitation of movement of the left sterno-mastoid muscle, and the appearance of pus in the external meatus when pressure is exerted on the swelling. All of the above routes by which infection reaches the surface give rise to classical mastoiditis. By classical mastoiditis we mean that the suppurative process has proceeded from within outward, has perforated the cortex, and given rise to periostitis and perhaps to subcutaneous abscess. When, however, the route to the interior is more easily invaded than that to the exterior the suppuration process proceeds from within inward and perforates the inner table. For various anatomical reasons this route is less frequent than the other one, and consequently atypical or latent mastoiditis is less frequent than the classical form.

Atypical or latent mastoiditis is dangerous because one or more of several important structures may be threatened by invasion through the inner table. These are: (a) two blood vessels—the lateral sinus and the jugular bulb; (b) two nerve structures—the internal ear and the facial nerve; (c) two parts of the brain—the dura of the middle fossa and the dura of the posterior fossa.

Invasion of the blood vessels will give rise to the signs and symptoms of septicæmia and its sequelæ; extension to the nerve structures will give rise to acute labyrinthitis or paresis of the facial nerve; penetration to the dura may cause extradural abscess, meningitis and intracranial abscess.

DIFFERENTIAL DIAGNOSIS

Classical mastoiditis occasionally is difficult to differentiate from furunculosis. The following table of points, taken from Tod, is useful.

FURUNCULOSIS

Onset and course rapid; symptoms most marked at the end of third day.

Pain intense, increased on mastication and movement of auricle and on pressure with finger in front and below tip of mastoid process.

Auricle may be swollen and congested and may project slightly outwards.

There may be pitting of the skin on pressure owing to superficial œdema, which may extend over a large area above and behind the ear.

The external meatus is obstructed by one or more localized swellings which are extremely tender on probing.

The discharge is slight and seems to come from the apex of the furuncle.

On examination with a speculum the drum may be seen to be intact.

If the meatus is not completely obstructed, the hearing may be normal.

ACUTE MASTOID DISEASE

Onset gradual, not beginning before the third week after the onset of the acute middle ear suppuration.

No pain on mastication or movement of auricle; but tenderness on pressure over the body of the mastoid.

Auricle normal, but projects downwards and outwards from the head.

There may be pitting of the skin on pressure due to inflammation of the subcutaneous tissues over which the skin itself is usually freely movable.

The meatus may be swollen from general thickening of its walls.

The discharge is profuse and, on cleaning the ear, may be seen to pulsate.

On examination with a speculum a perforation will be seen.

There is usually marked deafness.

AIDS TO DIAGNOSIS

1. *From the tenderness over the mastoid.*—

Two points on the mastoid cortex are more vulnerable to carious erosion than the remainder of the surface. These are, first, at the tip, and secondly, over the antrum close to the auricle. Tenderness due to mastoid involvement is likely to be most marked at these points. Tenderness over the tip of the mastoid is a valuable sign. In eliciting this tenderness care must be taken to press inward and somewhat forward to avoid manipulation of the cartilaginous canal which is painful in the presence of infection of the external meatus. Tenderness present in the first few days of an acute otitis frequently disappears after incision of the drum. Should it persist, or subside and then recur, surgical mastoiditis is present. The sudden appearance of tenderness at a point not previously painful is an indication that surgical intervention is inevitable. If this point is at the back of the mastoid, lateral sinus involvement is probable.

2. *From the appearance of the drum.*—The so-called "drooping" of the roof of the canal is a very reliable indication of surgical mastoiditis. The ear drum is tightly attached to a ring of bone at its margin. Inflammation on or inside the drum does not pass this point. Therefore, with uncomplicated middle ear infection, even

when intense, the drum has a definite margin where it merges into the roof and posterior wall. But when the osseous meatus is narrowed at its inner end, and when there is no margin separating the drum from the postero-superior osseous wall, there is invasion of the periosteum in this region, and this invasion can only have come from within, that is, from the antrum. This sign is called *sagging of the canal roof* and is an absolute indication of the presence of surgical mastoiditis even in the entire absence of all external signs of mastoid disease.

3. *From the quantity and character of the discharge.*—If the discharge is purulent and profuse and continues for an undue length of time, even though there is an absence of all other symptoms, mastoiditis is present. If the canal be wiped dry and more pus reappears than could possibly have been produced in the middle ear in the elapsed time, such discharge must have its source in the mastoid antrum.

It is true that such otorrhœa may eventually subside. A very few such have subsided without unfortunate sequelæ. As a rule, however, one of three undesirable effects is produced: a chronically discharging ear, with its consequent discomfort and danger; partial destruction of the ear drum; (a perforation renders the patient liable to future middle ear infection with its complications); impairment of hearing.

It is dangerous to allow an ear to discharge longer than from four to six weeks. When profuse discharge suddenly ceases and still more when decrease in the amount of discharge is accompanied by a rise in temperature,—surgical intervention is indicated. When the discharge is very profuse, serous and bloodstained,—mastoiditis is present, but the time for surgical interference will vary with the judgment of the surgeon. The majority prefer to wait until this stage is passed.

The absence of pulsation in the secretion as it flows from the perforation in the drum points to a low tension of secretion in the middle ear and antrum. The more pronounced the tension, as shown by pulsating discharge, the more probable the involvement of the mastoid.

4. *From the temperature chart.*—High temperature in simple infection of the middle ear should disappear very quickly after incision of the drum. The mastoid is involved if the high temperature persists, or if the temperature subsides for a time and then slowly but steadily

rises. Steady high temperature, with or without chills and sweats, should give rise to the suspicion of lateral sinus infection, septicæmia, pyæmia or meningitis. In children all other causes of high fever, especially pyelitis and pneumonia, must be eliminated before the mastoid be held responsible.

5. *From the x-ray.*—In doubtful cases x-ray examination may be of great value. Both mastoids should be radiographed for comparison. The indications that surgical mastoiditis exists are as follows:

NORMAL MASTOID	MASTOIDITIS PRESENT
Many cells visible.	Few cells distinguishable.
Cell partitions present and distinct.	Cell partitions absent or blurred.
Cell markings cover the mastoid like a web.	Large areas without cell markings.
Mastoid area, clear.	Mastoid area, fogged.

"Valuable as x-ray findings are they should not be accepted as an indication of surgical mastoiditis in the absence of confirmatory clinical symptoms."

CONCLUSION

To be able to diagnose the complications of latent mastoiditis is valuable, but it is far more important to be able to diagnose the latent mastoiditis before the onset of any of the many possible complications. When a patient's ear has been discharging for more than four weeks my advice is that the physician should throw part of the responsibility on the shoulders of an otologist. The setting of a definite time limit is hazardous. Many ears discharge four weeks or longer and eventually return to normal. Acute mastoiditis may completely subside. On the other hand mastoiditis, or one of its complications, has been known to occur long after the middle ear had returned to normal. It is this fact that makes me urge cooperation with the otologist.

In this paper have been enumerated certain aids which the otologist finds of value. There is one other valuable aid which has not been mentioned. It is the general appearance of the patient. A pædiatrician's statement that the patient looks sick and in his estimation is toxic is of great importance. I would go so far as to say that, in the absence of other causes, if there has been acute otitis media of long standing and the patient is slowly going downhill latent mastoiditis is present and operation should be performed.

PREVENTIVE PÆDIATRICS AND ITS RELATION TO THE GENERAL PRACTITIONER*

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"Spoke I not unto you, saying, 'Do not sin against the child?' " Genesis xlii, 22.

"In the twentieth century, pædiatrics was elevated from its ancillary status as a 'dependent dwarf' of ordinary medical practice into the larger atmosphere of social medicine, of which it is now one of the most important independent branches. This was due to the menace of infant mortality as the chief cause of the depopulation of modern states, with the consequent extension of the science of infant nutrition and metabolism, and the creation of the new science of infant welfare, as ways and means of combating the evil. It has been the universal experience, in all times and places, that the mortality of hand-fed infants is higher than that of the breast-fed. In this regard, it is highly significant, as Heubner says, that while the science of infant diseases and their treatment is a plant of almost recent growth, the generic idea of the importance of infant welfare, as the basis of racial or national hygiene, has excited human interest from time immemorial. The modern movement is only the logical expression of a folk-intuition, which exists, in crude form, even among semi-civilized peoples."¹

FALLING death and morbidity rates compel recognition of the possibility that public health work is restricting the field of curative medicine. But the shrewd horse trader of years ago sold his livery stable and installed a garage. The physician of the kerosene oil era derived a large part of his income from the treatment of diphtheria and infantile diarrhoea. While income from these sources has been greatly reduced, the physician of the gasoline age has opportunity for more practice, and of a better kind. There are figures available to demonstrate the truth of this statement. In 1927, 82 cases of diphtheria were reported in the State of Michigan for every 100,000 of population. The income from treating 82 cases at \$50.00 each would be \$4,100. For every 100,000 of population in that state in 1927, 2,200 babies were born. Immunization of each of those babies, at only \$3.00 each, would have yielded an income of \$6,600 in each 100,000 of population, and this takes no account of the pre-school and school children, who number respectively about four times and ten times as many as the babies. The inference would

appear to be that the doctor should take a leaf from the horse trader's book².

One may draw conclusions from facts a little closer home. In Toronto in 1914 the infant death rate was 155.6 deaths per 1,000 births; in 1929, 62 deaths per 1,000 births. In 1914 in Toronto there were two physicians restricting their practice to diseases of children, while in 1929 there were 16 so limiting their practice. In 1914 the first Child Welfare station was opened, and, in 1929, 24 were in active operation. During this 15 years' period an active program of health education has been broadcast by the Health Department and the Hospital for Sick Children, with the result that the public, in all classes of society, is becoming familiar with the fact that "prevention is better and cheaper than cure." In view of this intensive campaign for the reduction of child mortality and morbidity these 16 specialists are doing well in their practice, which consists of, in 50 per cent of cases, giving advice to the mother on the prevention of disease.

Of course some general practitioners complain of this reduction of illness and consequent diminution of income, but whose fault is it? The people are going where they can best buy health for their children. When they consult their own private physician regarding malnutrition or immunization they are told that "the child will grow out of it" or "that injections for the prevention of scarlet fever or diphtheria are only in the experimental stage." The result is that the parent takes her child elsewhere to get the desired advice and recommendation. What better argument have we for preventive medicine than the example of the Metropolitan and Prudential Life Insurance Companies in spending millions of dollars on health education especially as it pertains to the child?

Medical societies and associations hold meetings to determine the best method of protecting the physician in general practice, and to debate

*Read at the annual meeting of the Ontario Medical Association, Toronto, May, 1930.

whether state medicine has the right of "cutting in" on their practice. Whose fault is it but our own? We have the same tools and methods that are employed by insurance companies, and both local and provincial boards of health, so why not use them, and make our contribution to the country by preventing disease?

What physician can cure heart disease, rheumatism, typhoid fever, etc.? But we all know, or at least should know, how to prevent them. Probably the greatest advance in recent years has been made along the lines of nutrition. It has been shown, both experimentally and clinically, that the resistance of the individual child can be increased by proper feeding and the exhibition of certain vitamins; that the only method of curing endocarditis, rheumatism and chorea is by removing foci of infection before the germs have gained entrance to the system. Why wait till the diagnosis is self-evident? Even at this stage the parents usually are suspicious of what is wrong. Why allow a child to remain in contact with a tuberculous mother or father. Why allow any child to drink raw milk when we know that 42 per cent of the cows in the Province of Ontario are tuberculous, when the mere boiling of the milk eliminates this infection and thus prevents tuberculous cervical adenitis, tracheo-bronchial tuberculosis, Pott's disease and hip disease? These are only a few of the preventable conditions.

It might be said, and I think correctly so, that pædiatrics has been the pioneer specialty in preventive medicine. From the very beginning of the work in pædiatrics prevention has been the all-important theme, and to-day the best work is done in preventive pædiatrics. The field is so comprehensive that it is impossible to do more than touch on the most common and important points.

DISEASES OF THE NEW-BORN

Unfortunately in this division we have not the scope for prevention that we have in the others. Asphyxia and atelectasis depend to a great extent on the conditions prevailing at the time of labour, and by proper obstetrical technique should be reduced to a minimum. Intracranial hæmorrhage, so frequently due to undue force during delivery, particularly in version or difficult labour, is most commonly found when there is a disproportion between the head and the pelvis. Particular care should be exercised in safeguarding against obstetrical or brachial

paralysis. Hæmorrhagic disease may be cured by the injection intravenously of a small amount of compatible blood. Indeed this procedure should be adopted at the first evidence of hæmorrhage in the new-born rather than waiting till the infant is almost exsanguinated. Infections of the cord and skin should be most zealously guarded against by aseptic technique. General infections arising from the navel are almost invariably fatal on account of the ever-present septicæmia in such cases. One of the most brilliant achievements of preventive medicine is the prevention of ophthalmia neonatorum by the method of Crédé through the instillation of a one per cent silver nitrate solution into the conjunctival sacs of new-born infants.

NUTRITION

The nutrition of the infant or child is probably now the most important and effective method for the control of disease that the physician has at his disposal. Undoubtedly the most difficult feat in medicine to-day is the artificial feeding of the new-born, and it is among this age group that most of the deaths occur. For this reason great stress should be laid on breast feeding. Wherever propaganda for more breast feeding has been instituted there has occurred a marked improvement. In 1917, in Toronto, such a campaign was instituted in the various child welfare clinics with most gratifying results, so that, even with the improvement in the technique of artificial feeding, breast feeding is more prevalent throughout our clinics than it was twelve years ago.

It is, of course, impossible to consider the details of infant feeding in one paper, but one can bear in mind the essential principles underlying the dieting of infants. There must be sufficient fat, carbohydrate and protein. The amount of fat and protein necessary is supplied by $1\frac{1}{2}$ ounces of whole milk per pound of body weight, while the carbohydrate is supplied by giving 1 ounce of sugar for infants under 12 pounds and $1\frac{1}{2}$ ounces for those over 12 pounds. The fluid requirements may be met by giving approximately 3 ounces of fluid per pound up to 40 ounces. In the construction of all infant diets ample provision must be made for the vitamin requirements. Every infant, whether breast- or bottle-fed, should be given one half a teaspoonful of biologically tested cod-liver oil three times a day, which amount is gradually increased until at three months of age it will be getting 1 teaspoonful 3 times. Add to the

cod-liver oil sunlight and the prevention is doubled. Unfortunately sunshine's greatest fault is its price, so to prevent rickets, tuberculosis, etc., we isolate a minute portion of the solar spectrum and sell it to our patients in the form of ultra-violet ray to infra-red heat. And I am not unmindful of the fact that there are fussy mothers who would rather have their babies tanned at two dollars per treatment than by the sun's rays³. By the exhibition of cod-liver oil and sunlight one can be assured that neither rickets or xerophthalmia will occur. In order to prevent scurvy at least 2 teaspoonfuls of orange juice or 4 teaspoonfuls of strained canned tomato juice should be given from three months on. By observing these simple rules it is possible to build healthy infants with good resistance to infections and free from both rickets and scurvy. In the City of Toronto at the present time it is a rarity to see a child with active rickets or scurvy. Indeed, the vast majority of young mothers of to-day are well aware of these facts, and in my opinion it is a reflection on any medical man to have either of these diseases develop among his patients.

INFECTIOUS DISEASES

The greatest menace that exists to-day in medicine is the common "head cold", with its resulting complications, such as otitis media, mastoid disease and bronchopneumonia, etc. How soon will physicians learn that common head colds are much more contagious than either scarlet fever or diphtheria? How helpless we are in curing them, even with all the drugs in the pharmacopœia at our disposal; yet the average practising physician gives little advice regarding their prevention. I think it will be agreed that if the nose and throat infections were eliminated from medical practice most of our work would consist of making periodic health examinations, and yet this is what modern medicine is approaching. Consider for a moment the complications arising from nose and throat infections, viz., otitis media, mastoiditis, bronchopneumonia, empyema, septicæmia, all rheumatic complications, and probably all severe blood diseases through metastatic involvement of the hæmatopoietic system, acute nephritis and sinus disease, etc., and the magnitude of the problem becomes evident.

As stated previously, there is no cure for these diseases; the patient recovers or not according to his ability to overcome the infection through

the development of immune bodies. Therefore, it is obvious that our efforts must be devoted to instruction of the public in the prevention of these disabilities. One must lay stress on the proper atmosphere of a home, which should be moist and of an even temperature, because in this way the mucous membranes are maintained in a healthy state. Most important of all, however, is the prevention of contact with infected individuals. Again, diet may be said to play an important role, for if the child is not fed a properly balanced diet with adequate anti-infection vitamins its resistance is lowered, and last, but not least, is the removal of focal areas of infection, such as diseased tonsils, and this latter point brings us to the consideration of a separate branch of the subject, namely, rheumatism and heart disease. Again, we have no cure in spite of the tremendous amount of research that has been done. There is nothing left but prevention, and prevention can only be accomplished by the early removal of the infected tonsils before the infection has spread to other parts of the body. One cannot expect a permanent cure of either rheumatism or heart disease by removing foci, because some damage has already occurred, and there remains within the body another nidus of infection. The preventive measures must be instituted before these diseases have occurred, and this can only be determined by a routine inspection of the child when well.

Let me state emphatically that there is no age limit for the removal of diseased tonsils. Infants withstand the operation equally as well as older children. In my experience I have never seen a case of heart disease or rheumatism in a child when the diseased tonsils had been removed before there has been time for the infection to enter the system, and furthermore, our severest cases of focal infections, their results and complications come to the Children's Hospital from the rural population where health supervision is practically nil.

The most time-honoured preventive procedure in pædiatrics is vaccination against smallpox. This disease has fortunately become so rare that we are in danger of disregarding the means of protection against it. All children should be vaccinated before the first year is over.

Diphtheria exists only through the tolerance of the population. We have adequate means for its extermination. Since in young children there are but few immunes it is hardly worth while to Schick test them, but instead the uni-

versal use of toxoid is suggested in those under six years of age. So far most of the diphtheria prevention work has been done in school children, but as the greatest death rate occurs among pre-school children it is also highly important that all infants be protected by toxoid before the first year. Among my own clientele I have not seen a single case of diphtheria in the past ten years. Each child should be re-Schicked at least once a year.

Regarding scarlet fever the same statements may be applied. Time has, so far, however, not permitted a statement as to the results. Among many hundreds of my own patients given active immunization I have only encountered one case of scarlet fever in a previously immunized child, and this patient did not return to be re-Dicked at the appointed time, viz., 6 months, otherwise the lack of immunity would have been discovered and the child given an additional dose of scarlet fever toxin.

Most adults have had measles, and while the germ is not known we do know that the blood of an adult who has had measles contains protective bodies, so all that is necessary is to get from either parent 30 to 50 c.c. of blood, which should be citrated, and inject this into the exposed infant. It must be done, however, within four or five days of the exposure if protection is to be obtained.

Mumps is, of course, a rather mild disease especially among children, but at any time you wish to give protection bleed someone who has had mumps any time during life and inject the child, and you will probably succeed. In infantile paralysis the same procedure is adopted, but the diagnosis must be made in the pre-paralytic stage if any result is to be obtained. In whooping-cough we have a vaccine which we think does some good. It probably prevents a certain percentage of those exposed from contracting the disease that otherwise would get it. This is especially valuable in very young infants in whom the death rate is greatest⁴.

Tuberculosis presents a serious problem in infancy and childhood. The type of infection of chief importance is that due to the human bacillus, although of late research has shown that bovine infection is very common especially in rural districts.

Milk is probably one of the most important sources of tuberculous infection, both with the bovine and the human type. Pasteurization or boiling for three minutes insures absolute pro-

tection, and there are no objections to either of these procedures in infant dietetics. As a matter of fact, boiling ensures better digestion of the milk by infants, and it should be made compulsory for all infants under two years to be given only boiled milk. Especially is this true when one considers that the mortality of infected infants under one year, even with the best of care, such as removal of the infant from its tuberculous environment, preventorium treatment with its invaluable artificial quartz-lamp therapy, is 75 per cent, and in infants from one to two years about 50 per cent. Active immunization with non-virulent tubercle bacilli, as practised by Calmette in France, has not yielded the results that were first expected. During the past 15 years, in the City of Toronto, since the institution of pasteurization of milk, there has not been seen a single case of abdominal tuberculosis (bovine) in the Hospital for Sick Children.

In the case of syphilis, prevention lies in the hands of the obstetrician. There is no excuse for the continued occurrence of congenital syphilis with the methods of treatment of the disease at present available. The mother should be actively treated during pregnancy, even if she has the disease only in a latent form. In untreated cases the prognosis is extremely bad, as the percentage of still-births is fairly high in syphilitic mothers, and there is practically no chance for the child to escape inherited syphilis. During the past ten years at the Hospital for Sick Children there has been a very marked reduction in the number of syphilitic infants admitted to either the clinic or the hospital, while the more severe manifestations of the disease are rarely encountered.

MENTAL HYGIENE

Under this caption must be considered the large and important subject of heredity. The physician must do all in his power to discourage the marriage of unsuitable individuals, in order to prevent the appearance of inherited conditions of a crippling character, especially epilepsy and idiocy. We must bear in mind that "babies are not ground out of meat machines", but that they inherit from the chromosomes passed down to them the various biological defects that were inherent in their ancestors, and help to fill our already overcrowded institutions for the feeble minded.

The environment of the child must be guided by the physician. He must give advice concerning the details of early training in obedience,

habit formation, temper tantrums, etc. How often do we see the young infant stop crying at two weeks of age when it is picked up by either parent. Herein lies the potential Juvenile Court case. Unless the parents are guided by the physician, even at this early stage, the infant soon learns to "put it over its parents like a tent". The parents should be made to understand that a great deal depends on the atmosphere of the home, and that the child brought up in an atmosphere filled with tension and querulousness cannot but show resultant strain on its nervous system.

Last, but not least, is school hygiene, sanitation and ventilation. Much publicity has been focussed on this section of preventive medicine, so that the subject is, or ought to be, fairly familiar to us all, and time does not permit a discussion of this well known phase of preventive medicine.

The development of preventive pædiatrics in private practice is taking place with increasing rapidity, although it is not so obvious as the more spectacular, but less efficient, health centre development. If the preventive pædiatric viewpoint of the relationship of the physician to the child is to reach the great mass of children in its most efficient form it will only do so through the family physician.

We hold that the pædiatrician in practice is fundamentally a family or general practitioner, in that his special interest is in an age period—childhood—rather than in some anatomical part or system of the body, or in some special disease or type of disease, as form the basis of all other medical specialties. He is, however, more entitled to the term "pædiatrician" than the scientist who devotes his time to the chemical or biological study of the diseases occurring in childhood. Both are necessary in the field of pædiatrics, and the two should work hand-in-hand, as each is dependent upon the other. Without scientific investigation pædiatric knowledge would stand still. But how useless would be the work of the medical scientist without the practitioner to apply the discoveries of the laboratory worker in the prevention and treatment of disease.

To the criticism made so frequently of the lack of interest in this field on the part of the family physician, the answer is that a man trained to think of medicine in terms of disease alone, both because of his medical school training and his years of daily work, cannot be expected to

change his viewpoint overnight, and think of children in terms of health and of disease secondarily. Despite the impetus given to the scientific study of disease in the pædiatric departments of our medical schools in the last ten years, which has been a most desirable and needed development, the teaching of pædiatrics must come more and more to centre about the teaching of the child's development both mental and physical, and the way normal development may be attained and pathological deviations be prevented. When this time comes the physician will have the preventive pædiatric viewpoint. It is not that the teaching of the pathology and scientific methods of treatment of disease is to be minimized in any way, but that the developmental phase of infancy and childhood is to be stressed.

We have reached a point where the child hygiene movement has aroused such an interest on the part of parents in the health and development of their children that even in the small communities they are turning to the physician who has specialized in "children's work". From two pædiatricians in Toronto fifteen years ago, and four in the Dominion, there are now in Toronto sixteen, and in the Dominion forty-eight. This is in large part due to the demand created by the child health movement. Every year sees more and more men returning to the medical centres for post-graduate work in pædiatrics. Many of them state that they are impelled to do this by the type of service the families in their practice are beginning to demand. Fundamentally, he must be a competent well-trained physician, but his interest must primarily be in the health and development of his patients rather than their ills.

There is a decided lack of appreciation on the part of physicians of the extent to which the community has been educated to the value of preventive medicine and preventive pædiatrics. Many families are leaving their family physician to-day and turning to the pædiatrician, with a statement to the effect that the family physician is fine when the children are sick, but has no interest in the children otherwise. In other words they expect and demand supervision of the child's development, and turn to the physician who is qualified to give it. This means, ultimately, that the parents realize that they will obtain better service from the pædiatrician when the child is ill. Of course such service should be adequately paid for. One of the distinct

faults of the profession has been to look upon the function of giving health advice as something gratis, charging only for the repair work.

As to the extent of the services very little can be said, as the problem varies with the individual child and depends upon such factors as type of feeding, etc., for the normal child two or three conferences in the first months, followed by monthly examinations for the rest of the year; tri-monthly examinations in the second year; semi-annual ones until the sixth; and then an annual examination.

Finally, it is well worth emphasizing that at present fully 50 per cent of pædiatric practice is devoted (and it is hoped that still more will be in the future) purely to the supervision of the normal child, with particular care as to the diet, advice as to hours of work, play and sleep, as well as immunization and periodic examinations for the detection of early symptoms of disease.

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THE LATE SEQUELÆ OF ABDOMINAL SECTION IN THE PRESENCE OF INFECTION

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ANY abdominal operation performed in the presence of infection is done as an emergency measure. The surgeon will be limited in his endeavours by the presence of pus, and spread of infection cannot be guarded against with any degree of certainty. For this reason certain sequelæ may become manifest after the primary focus has been cured and the abdominal wall healed; these we may term late sequelæ. They may appear in a variety of locations, and, depending on the virulence of infection, may appear with symptoms and signs which demonstrate their location with ease and certainty, or again, that mask the location with obscurity and difficulty.

Infection in the abdomen may spread by three routes—by direct extension, by the lymphatics, and by the blood stream. Direct extension of the bacteria is most likely to take place before laparotomy has been performed, but that there are considerable possibilities of spreading the infection at the time of operation must not be lost sight of. Usually any complication due to a local extension of infection will subside once drainage is established, and pus pockets in the neighbourhood of the initial lesion are most likely to drain towards the exterior. In most cases drainage will continue through the operation wound until the abdominal cavity is clean. Extension by the lymphatics is much more likely to involve structures at some distance from the initial lesion, and the spreading by the blood

TABLE

Original lesion	Sequelæ which may be late developing
Suppurative appendicitis	(a) Local adhesions, (b) Subphrenic abscess, (b) Subhepatic abscess, (c) Liver abscess, (a) Pelvic abscess, (b) Chronic hepatitis, (b) Gall-bladder infection, (c) Empyema, (c) Pulmonary embolus,
Perforated ulcer, duodenal or gastric	(a) Periduodenal adhesions, (a) Obstruction of common duct, (a) Pelvic abscess, (a) Subhepatic abscess, (a) Subphrenic abscess,
Empyema of gall-bladder	(a) Local adhesions in right quadrant, (b) Chronic hepatitis, (b) Cholangitis, (a) Fixation of right diaphragm, (a) Subphrenic abscess, (a) Subhepatic abscess.
Diverticulosis	(a) Pelvic adhesions, (a) Chronic cystitis, (a) Chronic constipation, (a) Pelvi-rectal abscess, (c) Empyema.
Pyosalpinx	(a) Pelvic adhesions, (a) Chronic cystitis, (a) Chronic obstruction from adhesions, (b) Perinephritic abscess, (b) Subhepatic abscess, (b) Subphrenic abscess, (c) Empyema.

- (a) Direct extension.
(b) Extension by way of lymphatics.
(c) Extension by way of blood stream.

stream of infective emboli which lodge anywhere in the body may initiate a secondary lesion of even greater importance than the primary one. The accompanying table shows briefly the sequelæ of various infective abdominal lesions, and indicates by which route infection has spread.

No attempt will be made to take up in detail all of these complications, but a few of the more important ones will be described briefly.

SECONDARY ABSCESS

By far the most common site of a secondary abscess is in the pelvis, due no doubt to inadequate drainage with the patient in the Fowler position. These abscesses sometimes rupture into the bladder or rectum, and in the female may rupture into the vagina; and occasionally infection may spread by means of the cellular tissue of the posterior abdominal wall, infecting the perinephritic tissue, resulting in abscess formation in this region. The following abstract of a case is instructive:

J. H., a female, aged 23, was operated upon on Dec. 1, 1929. A subacutely inflamed appendix was removed from the pelvis, together with a large pyosalpinx. The abdomen was not drained. The wound healed by first intention. The stitches were removed on the 8th day; the patient was up on the 9th day, and was counting on leaving the hospital in a few days. Because of elevated temperature, rapid pulse and symptoms of influenza she was not allowed to go home. In a few days she complained of pain on the right side, and the temperature increased to 104 degrees. She continued to run a septic temperature for three weeks before any definite localizing symptoms developed. Finally definite signs of perinephritic abscess could be demonstrated, and after incision and drainage of the kidney pouch she made a satisfactory recovery.

SUBPHRENIC ABSCESS

Spread of infection throughout the lower abdomen is in no way comparable in seriousness to infection of the upper abdomen; for this reason subphrenic abscess must be given careful consideration when it becomes evident that some secondary lesion complicates the original disease. The majority of these cases follow perforation of a peptic ulcer or the vermiform appendix. They may remain obscure for a time, but eventually careful examination will reveal a resistant and tender area in the right upper abdomen, with dullness and absence of breath sounds at the base of the right lung. The mortality is high in this complication, but prognosis is more favourable the earlier operation is performed. The operation of transpleural laparotomy should be done in two stages. It is applicable to posterior subphrenic, liver and sub-hepatic abscesses.

ABSCESS OF THE LIVER

It seems natural to consider liver abscess in close association with subphrenic abscess. An occasional abscess of the liver may follow an attack of suppurative appendicitis. The following case is instructive:

P. H. had been operated on one month previously for suppurative appendicitis. He entered hospital with jaundice, chills, a temperature of 101°, pulse 110, respiration 30. He was extremely ill, and died a few hours after entering hospital. No operation was done. The following abstract of the important points of the autopsy notes illustrates this sequel of suppurative appendicitis very well:

"The liver was adherent to the under surface of the diaphragm, and to the colon, intestines and abdominal wall. The liver was markedly enlarged, extending about one and one-half inches below the costal margin and over to the left side in the region of the spleen. Pressure causes pus to appear in the upper and anterior surface of the liver. The liver with the exception of the left lobe is composed for the most part of communicating cavities with purulent contents resembling a large pus sac. The gall-bladder and bile ducts show no abnormalities."

UPPER ABDOMINAL ADHESIONS

An infected upper abdomen may leave behind adhesions in the neighbourhood of the common bile duct or the pylorus. Although inflammatory adhesions usually become absorbed, yet there are cases in which the inflammatory adhesions leave permanent deformity of the pylorus, with interference with the emptying of the stomach, or the common bile duct may be stenosed so as to interrupt the flow of bile, causing obstruction and persistent jaundice, even to the point of simulating malignancy.

INTESTINAL OBSTRUCTION

Intestinal obstruction may follow any abdominal section at any time after operation. The symptoms need not be enumerated here. The seriousness of the situation is now so well appreciated that I will simply illustrate this sequel by the following history:

Mrs. G., aged 44, operated on for acute suppurative appendicitis on January 12, 1924. Stitches were removed on the 8th day, and the patient was out of bed on the 11th day. On the 12th day she was taken violently ill with pain in the abdomen and vomiting. The vomiting was most persistent. The temperature was subnormal; the pulse weak and thready. Enemas came away clear. Operation was performed at once. Complete obstruction of the terminal ileum was found, due to a band of omentum adherent to the posterior wall of the right iliac fossa. The patient made a good recovery.

EMPHYEMA

Outside the abdominal cavity the most important sequelæ of the infected abdomen will be found within the thorax. These are likely to be acute, *e.g.*, lobar pneumonia, broncho-pneumonia,

purulent bronchitis, pleurisy or empyema; occasionally inflammation of the pleura may be a late sequel. A patient who has been in bed a long time, and whose convalescence has been very slow and up hill, has been allowed to go home, still far from well, and running a persistent fever of a degree or so. As time goes on he becomes more anæmic and emaciated, the temperature is soon elevated and runs a hectic course. Severe sweats follow. Examination of the chest shows the physical signs of fluid, and the aspirating needle demonstrates pus. If the collection of pus is small it may be localized with great difficulty.

PULMONARY EMBOLISM

Pulmonary embolism usually occurs between the 10th and 21st day, but may appear later. If the blood clot is large enough to block the bifurcation of the pulmonary artery a fatal termination will be the result, but undoubtedly there are cases where the embolus is small, result-

ing in the blocking of a terminal artery, and producing an infarct of the lung with the characteristic signs and symptoms.

INCISIONAL HERNIA

This complication may be a sequel to any laparotomy due to inefficient closure, but is more likely to follow cases where drainage has been necessary over a long period of time. Symptoms will be more severe in those incisions situated in the lower half of the abdomen. The abdominal contents may be in direct contact with the skin and fascia. Strangulation is rare, except when the aperture is small, but adhesions between the abdominal contents and the wall may cause colicky pain or vomiting. A truss or belt is usually of little assistance to the patient. The advisability of operation will have to be considered, and it must not be forgotten that failure of secondary closure leaves these patients in worse condition than before.

Observations

ON

THE CONTROL OF TRACHOMA*

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TRACHOMA is practically extinct in England. It is still prevalent in some parts of the British Empire. It is rampant in some Eastern countries. Trachoma was at one time common in England. The conditions that have conduced to its virtual extinction are worth investigation. They may point the way to measures calculated to secure a similar result elsewhere.

The necessity for control of a disease depends upon the measure of the damage done by it. To obtain this measure there would be needed a census of the eye conditions of the population. This is manifestly impossible. But we can fairly compare figures drawn from the examination of sections of the population. These, al-

though not national maps, may be fair average samples. Hospital figures cannot be considered such samples, for they are obtained from selected portions of the population. The most desirable figures are to be obtained from the schools, and from the examination of recruits for military service.

Van Millingen,¹ in 1895, collected figures for eighteen countries. Clemow,² in 1903, supplemented these figures. They showed the wide spread of the disease, and the unequal incidence in the several countries. I have collected some later figures, and these show that whereas in some countries there is an effective control of trachoma, in others the problem is still of great magnitude. From these figures we may judge the vast amount of suffering and loss of economic efficiency caused by the disease in countries where it is rife.

Egypt still heads the list of afflicted countries.

* Made in opening a discussion in the Section of Ophthalmology at the combined meeting of the British and Canadian Medical Associations, Winnipeg, August 27, 1930.

In the last report³ of the Ministry of the Interior of Egypt there are some astounding figures of the prevalence of trachoma among school children. An ophthalmic survey was carried out among all the pupils of the primary schools in certain capital towns of the provinces in which there were ophthalmic hospitals. There were seventeen schools with 8,045 pupils; "91 per cent of all pupils were found to be infected with the various stages of trachoma, whilst 23 per cent of the total were found attacked with the serious stages of trachoma." The figures are so amazing that one might ask whether the diagnosis of trachoma in so great a proportion of the children could be justified, and whether perhaps some other follicular condition might not have accounted for many. But there are available the series of reports of this department when the work was under the direction of A. F. MacCallan which fully bear out the high incidence. Also, there is Lister's⁴ record of the examination of the Egyptian members of the Labour Corps employed in France by the British authorities in the great war—"at a low estimate 45 per cent were either suffering from or had had trachoma."

China runs Egypt close. Some 25 per cent of the population appears to be affected. In the dramatic story of Prof. Harvey Howard's captivity by Chinese brigands⁵ there is this passage:

"Famines, floods and disease are rampant in China, but it is common knowledge that the most devastating of these three is disease. And of all the disease, the one that is the cause of the most misery and economic distress is probably trachoma. It is found all over China; it affects nearly every home, and all classes of society. From statistics I had gathered, I had come to the conclusion that fully one hundred millions of Chinese people have trachoma, and that probably five million new cases, mostly children, develop each year. I had estimated that not less than one million Chinese are blind in both eyes, and that three or four millions more are blind in one eye; further, that not far from twenty millions have had their vision so much impaired by inflammation and the formation of scar tissue, due to trachoma, that they are able to eke out only the barest kind of existence."

The situation in India is better. Members of the Indian Medical Service have told me that although there is much trachoma it is less severe than in other Eastern countries, and is less important as a cause of blindness. The reports of the Madras Government Ophthalmic Hospital⁷ for the six years from 1923 to 1928 show that of an average of 21,000 new patients each

year about 4.5 per cent. were suffering from trachoma.

There are two recent reports for European countries in the papers of the League of Nations. In Italy, Lutraria⁸ reports that trachoma is met with in almost all parts, but it is most common in the islands of Sardinia and Sicily. The army figures of 1913 show that of 502,221 conscripts, 3,543, or 0.7 per cent, were rejected for chronic conjunctivitis believed to be trachoma. In some of the islands the proportion of rejections was four times as high.

In Holland, Josephus Jitta⁹ reports that trachoma is found only in Amsterdam, mostly among the poorer Jews. A commission of inquiry, sitting in 1914-17, reported the existence of 3,300 cases. Of 66,418 Christian children 2,396, or 0.6 per cent, and of 7,062 Jewish children 625, or 8.8 per cent, had trachoma. He is of opinion that trachoma is not endemic in the country, but that it was imported from Poland and Russia. He states that it is above all a family disease. Children are affected at an early age, either by their parents or by older children.

In the British Isles, Ireland shows most trachoma. Story¹⁰ reported that there was a decrease towards the end of the century, but that in later years it has increased.

"Most of the credit for this increase is to be given to the American doctors, who inspected all immigrants to the United States at the Irish ports, and remorselessly refused embarkation to any with even doubtful signs of trachoma. Consequently, large numbers of most undesirable aliens were left stranded in Ireland—whole families, perhaps, from far regions of Eastern Europe, and trachoma accordingly became more prevalent in this country."

In England the figures collected in 1922 by the Committee on Blindness¹¹ were informative, but to my mind the best picture of present conditions is given by the figures of the London school children. London is a vast area; it includes every variety of social condition and a considerable alien community. For the children in the elementary schools there is a regular medical inspection, and there can be no doubt that every case of trachoma is accounted for. The cases found in the years 1925 to 1929 numbered 26, 20, 15, 16, and 27, so that for five years on an average roll of 650,000 children there was an average of under 21 cases of trachoma a year, or 0.00032 per cent. When we recall the risks of importation of trachoma

through the huge shipping area of the Thames I think you will agree that trachoma is practically extinct in London.

In the United States, according to Webster Fox,¹² there is little trachoma among whites, except in some isolated parts of Kentucky, West Virginia, southern Illinois, and Ohio. It is common among the Indians. In 1912 of 39,231 Indians examined in reservations 8,940, or 22.7 per cent, had trachoma. The percentage varied in different places from 68.8 to 0.2. In 1924 the Indians of three reservations were examined to the number of 18,830; trachoma was found in 3,986, or 21.2 per cent.

The foregoing figures are sufficient evidence that there is need for a better control in some countries than exists at the present time, and that no country can relax its vigilance.

CLINICAL CONDITIONS

Trachoma means "a roughness," and a roughness of that silkiest of tissues, the conjunctiva. The name is a good one. In typical cases the roughness of the tarsal conjunctiva is uncanny. The term is an old one, and the disease is old. The disease was described, with an accuracy that will be little bettered to-day, in the works of Hippocrates and in the later authors of the Greek school, Aëtius, Paulus Aeginetus, and Alexander Trallianus. There is one passage in Celsus which may be cited:

Pejus etiamnum est (genus videlicet lippitudinis), ubi pituita pallida aut livida est, lacrima calida et multa profuit, caput calet, a temporibus ad oculos dolor pervenit, nocturna vigilia urget; siquidem sub his oculus plerumque rumpitur; votumque est, ut tantum exulceretur. Intus ruptum oculum febricula juvat: si foras jam ruptus procedit, sine auxilio est. Si de nigro aliquid albidum factum est, diu manet. At si asperum, et crassum est, etiam post curationem vestigium aliquod relinquit. (Lib. VI, cap. vi.)

The characteristic signs of the disease in its early stages are the slight ptosis of the upper lid, and a variable degree of discharge from the conjunctiva. The membrane shows a profuse overgrowth of the tarsal covering, so that it may look like a plush pile, or be grossly studded with enlarged follicles. Many cases are so little acute that there may be no outward symptoms of the disease save the slight ptosis, and in these the inflammatory process is dry and sluggish, and the harsh roughness of the tarsal membrane is marked.

Whether or not corneal involvement is a

necessary clinical character of the disease is a moot point. Wilson,¹³ of Cairo, thinks that it is. Other observers do not admit this. My own experience is that within the first year of the disease in children it is rare, and it may never appear if efficient treatment is begun early; but it is certain to appear in long-standing cases, especially among adults.

The disease is undoubtedly highly contagious. Doctors and nurses have been infected, and inoculation experiments have been done. Perhaps the most dramatic account of an experimental inoculation is that recorded by Treacher Collins¹⁴ in his account of the London ophthalmia schools. Children were loath to leave the lovely country schools to go back to the old-time town barrack schools, and deliberately irritated their eyes to prolong their treatment.

"One child, whose name peculiarly enough was Sly, was admitted with marginal blepharitis and slight conjunctivitis; this was cured and all treatment was stopped preparatory to her leaving the school. She was then caught by the nurse taking discharge from another child's eye who was suffering from trachoma and deliberately putting it into her own. The symptoms of acute muco-purulent ophthalmia rapidly set in, and two months later typical trachoma follicles on the tarsal conjunctiva were recognized. After a year's treatment the trachoma was cured."

The most striking clinical feature of the disease is its chronicity. From six months to two years is its usual duration, and most cases extend to the longer term. So strongly is this impressed upon me that I am critical of my own or of others' diagnosis when a case of suspected trachoma reacts speedily to treatment!

The histological feature of the changes produced by the disease is the extraordinary proliferation of the lymphoid tissue. There is a diffuse lymphocytic infiltration of the conjunctiva with numerous follicles occupying the sub-epithelial layer. A follicle may measure from 0.5 to 2 mm. in diameter. The periphery of a follicle is formed of layers of lymphocytes; in the central area are many large mononuclear cells. All the changes are most marked in the retrotarsal fold, but no part of the conjunctiva is exempt. The beginning of a cure is shown by the breakdown of the centres of follicles and the gradual growth of connective-tissue fibrils around the follicles. In advanced stages the fibrosis is so extreme that the follicles are strangled by the shrinkage of the scar tissue. Success in treatment is shown in a fine even

spread of the scarring. Failure is shown by a gross unequal scarring and consequent distortions of the lids with all their painful and disabling effects. I am inclined to the view that the worst end-results are sometimes due more to ill-advised severity of treatment than to the effects of the disease.

THE CAUSES OF THE DISEASE

The control of trachoma needs a knowledge of its cause and of the conditions under which it spreads. The primary exciting cause of the disease is as yet uncertain. There is a general agreement that it has the characters of a distinct entity, and such that it may certainly be ascribed to some virus. There is no doubt that its progress is affected by intercurrent infections, but none of these infections, which are common and well known, appears to be the determining cause. From the days of Koch's investigation of the disease in Egypt in 1883 there have been many attempts to identify specific organisms. So far no claim has been established. The most recent work is that of Noguchi,¹⁵ a piece of experimental investigation of much promise. His *Bacillus granulosus* is described as being present in the affected tissues in extremely small numbers in the vicinity of the small and large mononuclear cells constituting the follicles. It has been isolated in cultures; then it is found to have a single polar flagellum. The cultures have been inoculated into monkeys, and have induced conditions of granular conjunctivitis apparently identical with trachoma in man. Wilson¹³ of Cairo has published the report of an investigation he has made on the lines of Noguchi's work. His results are indefinite.

If the primary cause of the disease is uncertain there can be no doubt of some of the adjuvant causes. These are conditions of life which can be dealt with. Trachoma is rarely found except among people of low standards of living. It is found among squalid people who are herded together. In these conditions there is a common neglect of what we speak of as sanitary rules, but which may be better described as the rules of civilization. The easy communal generosity of the feckless has often been noted. Unfortunately, this liberality extends to the use of sanitary articles which in more developed communities are regarded as strictly personal. It is, I believe, to the careless but pernicious generosity of these people

that the ready dissemination of eye disease among them is due. When once the distinction of *meum* and *tuum* in regard to toilet articles has been learned there is a distinct rise in the standard of cleanliness, and therewith a lessened risk of communicable disease. I have known outbreaks of acute conjunctivitis in schools coincide with the breach of the rule of separate towels; and in no case have I known an outbreak spread where there was a strict re-enforcement of the rule. Confirmation of this observation may be obtained in the care of the men of the Chinese Labour Corps in France. These men at all times carried about their person a towel which was used for many purposes. It was freely loaned to companions. Lister found it necessary to arrange for a regular sterilization of these towels, and he was certain of the efficacy of this procedure.

LONDON SCHOOLS

In former days the chief breeding places of trachoma in London were the Poor Law schools. The children of destitute families were drafted into huge barrack schools. These schools were ravaged from time to time by epidemics of ophthalmia, which was always endemic. Stephenson,¹⁶ in an historical note, showed that the evil of these schools was known as early as 1848. In 1858 Bowman made recommendations regarding them. Ten years later similar recommendations were made by George Critchett. Nettleship in 1874 inspected all these schools, and of one he stated that "not 15 per cent of the eyes could be described as healthy." A report in 1888 by Litteljohn, the medical officer of one of the schools, in which he said "Children have contracted the disease in the school . . . to an appalling extent," attracted the attention of Parliament. An isolation school for ophthalmia was provided under the care of Sydney Stephenson. From later London reports I find that the separate attempts of the local London Poor Law authorities were amalgamated by the Metropolitan Asylums Board. Two ophthalmia schools were established in the country north and south of London in 1903 and 1904 in charge of Treacher Collins. At the time of the foundation of these isolation schools the average number of children housed in the Poor Law schools was 10,800. The accommodation of the isolation schools was 720. In the first

year 625 children were admitted, of whom 292, or 46.7 per cent, were suffering from trachoma. The segregation of affected children was so efficacious that in 1918 there were only 186 entries, so one of the isolation schools was closed. In 1921 there was a risk that the other would be closed too for lack of cases. It was therefore determined to admit children also from the elementary schools. Even with this far wider field from which to gather patients the demand upon the resources of the school at Swanley has been below the accommodation. In January, 1930, only 253 of the 364 beds were occupied. Thirty-nine were pauper children gathered from the Poor Law schools with a roll of 6,375 children; 12 were cases from outside London; and 152 were elementary school children. Of the total cases 67 were trachomatous, or 26.5 per cent.

A most effective agency in the control of trachoma is the School Medical Service. For the past twenty-five years I have been intimately connected with this work in the County of London. My duties as ophthalmic consultant include work at a consultation centre at the County Hall, to which are referred children whose sight presents special difficulties in education or medical treatment.

By Act of Parliament the education authority is responsible for the medical inspection and treatment of the school children. The schools are visited regularly and all the children examined in specified groups. Those requiring treatment are referred to their home doctors or to school clinics maintained by the authority. Parallel with this arrangement there is the School Attendance Department which has the duty of investigating the reasons for the absences of children from school. Absences of more than a specified period are reported to the head office for special investigation. This dual organization within and without the schools ensures a very complete supervision of the health of the children.

The efficiency of the organization was well demonstrated a few years ago. Early in 1924 an unusual number of absences from school on account of "external eye disease" were reported by the attendance officers in the Thames-side districts of Poplar and Stepney. A batch of the affected children was brought to the consultation centre at the head office. I found them

to be suffering from early and acute trachoma. Thereon all absentees and the other children of their families, and also the children of the schools they had attended, were medically inspected. A definite epidemic of trachoma was discovered among the children of a few schools in the poorest quarter close to the docks. Ordinarily cases of trachoma average a score a year for the whole school population of London. In this year, 1924, the numbers seen were: January, none; February, none; March, 17; April, 34; May, 51; June, 36; July, 51; August, 2; September, 4; October, 4; November, 10; December, 6; making a total of 215 cases. The affected children were transferred for treatment to the Swanley Ophthalmia School, now under the direction of Stephen Mayou, with the most satisfactory results. The epidemic was confined to the original area of its outbreak, and ceased at the end of the year. I have heard some hard sayings about the school attendance officer. It has been asserted he is as hard-hearted as the pedagogue of a familiar Pauline argument; but his strictness is an invaluable safeguard to the children, as was demonstrated in this outbreak. Imagine what might have happened in densely populated London if there had been no inquisitorial attendance officer.

WAR CONDITIONS

An example of large-scale prevention and treatment is recorded by the ophthalmic surgeons^{4,5} detailed during the great war for oversight of the Labour Corps. Large numbers of coloured men were brought into France for labour purposes. Trachoma was rife among them. It was recognized that with the proximity in which the individuals of the Labour Corps had to live there was a danger of trachoma becoming universal throughout these units. Had this occurred their capacity for work would have been greatly impaired, and there would have been a risk of the disease spreading to the British troops and to the French population.

The Egyptian labourers were highly affected. At a low estimate 45 per cent were either suffering from or had had trachoma. Of the South African Cape boys only 3 per cent were affected. The main problem was with the Chinese, of whom there were roughly 100,000. The incidence among them was 8 per cent—

that is, about 8,000 cases; besides these there were 5,500 cases of suspicious conjunctivitis.

The steps taken to remedy matters were three: (1) instructions were given that no labourers with trachoma should be recruited from abroad, and for those on the voyage sanitary treatment was given; (2) the affected men were segregated; (3) treatment was given to both the affected and the "clean"; the latter received zinc drops, and their towels were sterilized regularly. The effect of these measures was speedily apparent in the improved condition of the men and their work.

CONCLUSIONS

The evidence presented in this paper points to two certain conclusions: (1) that trachoma can be controlled; (2) that the control of trachoma is a practical proposition. The measures requisite to this control may be viewed from two points: that of the country where the disease is endemic, and that of the country free from the disease. It will be agreed that the principal condition favourable to the spread of trachoma is squalor, the product of bad social conditions. If we can raise the social status of a community, the risks of communicating trachoma will be reduced until they are small—as in England. Social conditions can rarely be effectively altered by outside influences, but this can be achieved if the influence works from within the community. There is now scarcely a country in the world that does not maintain some sort of system of elementary education for its children. Where there is such a system there is ready to hand the basis upon which an efficient campaign against trachoma can be waged. The recognition that a school for children is a place for the training of the child in the use and care of its body, as much as for the training of its mind, will make the school the most efficient prophylactic against contagious eye disease. Instruction in the care of the body engenders pride of body, and this in its turn fosters a sense of separateness or fastidiousness which is offended by a community of interests in toilet articles. That lesson is, I believe, one of the chief gains of civilization; without it our cities would be pest centres, instead of ranking with health resorts. It would do more to extirpate trachoma than any other measure. It would

create in countries where trachoma is rife the demand by teachers and parents for routine examination of the eyes of children on entry to school, at specific intervals, and of suspects at all times. Experience in London shows how readily medical inspection, at first resented, becomes demanded as a safeguard to all parties—the child, its family, and the teacher.

Discovery of disease demands treatment. Isolation ophthalmic schools, such as Swanley, are an economic proposition in countries where the incidence of trachoma is low; where it is high such measures are impossible. But it is possible to provide local dispensaries and travelling hospitals after the type of the beneficent foundation of Sir Ernest Cassel in Egypt. Further, it will be good practice to provide for the issue to the people generally of zinc sulphate drops. Regular and long-continued use of these drops in residential schools I have found safe and of value. There is evidence of their value in the control of trachoma among the coolies of the Labour Corps in France. David¹⁷ in Palestine records that during a local epidemic of ophthalmia the school children were unaffected so long as they used the drops, but they fell victims to the attack when their use was stopped. Maybe there would be a few cases where intraocular inflammations would be injuriously affected by the use of the zinc drops, but even with that risk in view I think the universal use of the drops would be justified in a trachoma-ridden country. Finally, in such countries there should be a rule reserving appointments to posts in the public services to the healthy, and disqualifying candidates with trachoma. There can be no doubt that such a rule would furnish an effective "sanction" in a campaign against trachoma.

In a country where trachoma is rare there will be a justifiable demand for the exclusion of immigrants suffering from the disease. In these days of widespread travel the risk of entry of communicable disease into a clean country is great. Quarantine is no service in the prevention of trachoma. The disease is too enduring. Exclusion is the proper remedy. There have been at various times outcries against the action of some countries in rejecting immigrants for failure to attain standards of health. In my view stringent rules as re-

gards health are wholly justified, both for the safety of the one country and for the improvement of the other. The fact that trachoma will exclude the immigrant in any country will do much to awaken the authorities of a trachoma-ridden country to the disability under which its nationals labour, and to the necessity for remedial measures.

In conclusion, I would venture to reiterate my belief that the best line of attack is through an efficient school service. Through this we can get an oversight of the children such as no other means will secure. The school also tends to inculcate a sense of personal responsibility that is invaluable to the common health. There is no doubt that if we could keep the children of one generation free from the disease trachoma would be extinct.

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DISCUSSION

MR. A. R. MOODIE (Dundee) discussed the value of the various measures already in existence, and considered that compulsory notification was a valuable weapon in the fight against trachoma. He mentioned that compulsory notification had been adopted in twenty-four countries, but that, in Great Britain, Glasgow alone had made the disease notifiable. There it was always followed up by treatment under the supervision of an ophthalmic surgeon.

During the first six years of compulsory notification in Glasgow (1914-19) the average number of cases notified was 74. During the period of 1924-29 it was 42—a decrease of 38 per cent. Thirty-nine per cent of the cases occurred during school age.

Of all cases, 99.2 per cent came from houses of three rooms or less and the incidence among inhabitants of one and two roomed houses was almost double that among families occupying three rooms.

Dr. Wibaut, at the Amsterdam Congress, had determined for each country its trachoma index, and according to this index had divided the countries into seven groups with indices ranging from 9.1 per cent, as in Great Britain and Germany, to more than 61 per cent, as in Egypt, Palestine, etc. A chart illustrating this was shown.

Anti-trachoma measures in Amsterdam included regular inspection of school children, a trachoma register, and treatment of a semi-compulsory nature.

In Italy, government subsidies were granted to local authorities to provide free ambulant and hospital treatment, and there were university courses for the training of medical men in early diagnosis.

The United States, in addition to immigration restrictions, instituted propaganda by lectures and literature. Infected areas were visited by teams of medical specialists and nurses, who, when considered necessary had their visits followed up by that of a mobile dispensary, in the form of a rail car fully equipped for carrying out treatment.

In Japan very wide powers had been delegated to administrative bodies, enabling them to carry out a general medical inspection when considered necessary. The poor received free treatment and instruction in prophylaxis.

MR. MOODIE thought it might be a useful thing for countries to offer prizes for scientific research.

DR. WHITESIDE ROBERTSON gave particulars of the Anti-Trachoma League, or as it was officially called "L'Organisation Internationale Contre le Trachome", which he had received from Dr. Wibaut of Amsterdam, and which had come into being in Geneva a month ago. He outlined the objects of the League, and the action intended to be taken. It was proposed to notify the different governments of the establishment of the League, to point out the devastating and contagious nature of the disease, and to ask for a moral and if possible financial support. The Union hoped to advance the cooperation of different organizations to make a centralized campaign, and when necessary to give advice about the best measures to undertake in controlling the disease. It was proposed to form a library on trachoma by asking authors to send reprints of any articles or books on the subject. DR. ROBERTSON described the Ophthalmic Schools at Swanley in Kent, and eulogized the work of Mr. Stephen Morgan who had control of them. For a country in which the incidence of trachoma was low, Swanley could be taken as a model. Some excellent photographs of the homes were passed around.

The Secretary read a communication from MR. STEPHEN MAYOU in which he stated that in conjunction with Dr. McCartney, Pathologist to the Metropolitan Asylums Board, he had carried out investigations, but that they had failed to isolate the *Bacillus granulosus* of Noguchi. In one instance a kindred organism had been isolated, which probably belonged to the xerosis group. They had failed to inoculate trachoma directly from the patients into monkeys. They had also experimented with the organism sent by the Rockefeller Institute, and had failed to reproduce trachoma in monkeys with their organism, although some redness and slight follicular enlargement was apparent for a week or so after inoculation. Ordinary monkeys kept in a dirty condition or in cages with sawdust or sand were liable to get some follicular enlargement from irritation.

PROF. JACKSON (Denver, U.S.A.) said that the American experience with trachoma had emphasized its contagious nature and the factor of family or racial immunity. In the Southern States the negro, living in large numbers, always gregarious, imported from Africa under general conditions as bad as those of immigrants from Southern Europe, and largely segregated from the whites as are the Indians, had remained practically free from trachoma. Cases occurred in negroes but very rarely, and rarely among those of mixed blood. The American Indians were very subject to trachoma, which had increased rapidly among them in the last one hundred years, until now a few hundred living on the shore of Lake Superior were reported as the only tribe free from the disease. In Philadelphia, forty years ago, all the cases of acute trachoma occurred in recent immigrants. In Colorado in the last thirty years most of

the cases had occurred among the Indians, chiefly those segregated on reservations.

The belt of what might be called indigenous trachoma in the United States began in the southern Allegheny Mountains, among the whites more purely British in origin than any other part of the population of the United States. The worst family and locality endemics had been found in the mountains of Kentucky and North Carolina.

He discussed the relation of the Noguchi bacillus to trachoma. Noguchi had obtained it from five Indians suffering from trachoma in New Mexico and Arizona. It was a small slender bacillus, which he called *Bacillus granulosus*, a name that has helped to favour the idea that it was connected with follicular disease of the conjunctiva other than trachoma. It had never been found in any other disease of the human conjunctiva, as have the so-called "inclusion bodies of Prowazek" and the "blue bodies of Lindner." It had been found in trachoma in patients other than Indians in the United States and in North Africa. It had been isolated in pure culture, transmitted for many generations, and its inoculation produced in monkeys a disease very closely resembling that produced by inoculations with material from the trachomatous conjunctiva. It had also produced disease in at least two inoculations into the human conjunctiva, which at least resembled early trachoma in man. From his watching the dozen monkeys that had been inoculated by Drs. Finoff and Thygeson, his belief was that the Noguchi bacillus was probably the cause of trachoma. He thought that a general search for this bacillus in all cases of trachoma should be made.

DR. A. J. BALLANTYNE (Glasgow) said he had been able to satisfy himself of the infectivity of the disease. He had been struck by the marked difference in individual cases in epidemics of conjunctivitis occurring in schools, convents, etc., and he thought that in cases called trachoma there might be more than one infection. He thought the tissue reaction a most important factor in determining the disease. He experienced great difficulty in tracing the origin of the infection in sporadic cases.

MR. ARTHUR W. ORMOND (London) considered that many cases called trachoma were simply follicular conjunctivitis, and there was no single factor which could conclusively prove that a patient was suffering from trachoma. He regarded epidemics of the disease as due to a mixed infection. In his own experience he had not had a case of a person blinded by trachoma. He agreed with DR. BALLANTYNE in considering that the soil was a matter of the utmost importance.

DR. AUSTIN A. HAYDEN (Chicago) described his own personal experience in contracting the disease while a House Surgeon in York. In the act of expressing follicles in a case of trachoma some fluid from the patient accidentally got into his eyes, and, although his eyes had been washed out within half an hour, he contracted the disease which was well developed in five weeks. He had known other doctors who had contracted the disease in a similar way, and whose general health, which was excellent, could not possibly have aggravated the disease. He strongly recommended the use of protecting goggles in dealing with cases of trachoma.

THE CORRELATION OF LABORATORY FINDINGS WITH THE CLINICAL ASPECTS OF DISEASE*

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TWO questions of great clinical importance were brought forth at the recent French Medical Congress:† *hyperthyroidism*, and *calcium metabolism*. To make a summary of the analytical account rendered in *La Presse Médicale* would be beyond the outlines of this address. The titles of reports and communications should suffice to excite the curiosity of those whom these questions interest, and to induce them to read attentively the official reports of the Congress:

LES HYPERTHYROIDIES:¹

Rapports: Etude clinique des hyperthyroidies. Physiopathologie de la Thyroïde. Traitement chirurgical de l'hyperthyroidisme.

* Read before the Academy of Medicine, Toronto, on December 1, 1930.

† Held at Liège, September 23 to 27, 1930.

LE MÉTABOLISME DU CALCIUM:²

Rapports: Physiologie et pathologie générales du calcium. Le métabolisme et les fixateurs du calcium chez l'enfant. La calcémie.

Now let us point to what determined the title of this paper. With regard to hyperthyroidism, Mr. Marcel Labbé, whose authority is well known, affirms that disordered basal metabolism is the most important symptom of that disease. This test which has become common in the daily practice of the endocrinological services, offers to the clinicians the "so much desired criterion" which would liberate them from the confusion which prevails in the description of the different types of thyroid diseases, from typical Basedow to the lighter forms, which, according to Brams, number no less than 26 varieties. Against this categorical affirmation of the absolute value of

the basal metabolism test, Mr. Leopold-Levi protested. He has ascertained, with a no less extensive experience on the subject, that hyperthyroidism exists without any increase of basal metabolism, and even with hypo-metabolism; on the other hand that cases of increased basal metabolism happen with hypothyroidism. Consequently the clinician should not disregard the whole of the "small clinical signs" that guide the diagnosis towards hypo- or hyperthyroidism.

Let us pass on to the next reports, on *calcium metabolism*. These gave rise to a discussion on the value of the determination of calcium in the blood, for the diagnosis of rickets and spasmophilic states. Whereas one of the reporters, Mr. Brull, emphasizes the great value of the determination of calcæmia, Mr. Mouriquand affirms that he met with a great deception in the determination of phosphorus and calcium among real rachitics and spasmophiles. The calcæmia is often normal, sometimes paradoxical. "*The clinic should have its word to say*". But let us listen to Mr. Bezançon.

At the risk of being looked upon as retrograde, he considers that chemistry, in the matter of calcæmia, has not given him, in spite of all the efforts of his collaborators, MM. P. Weil and Guillaumin, all that he expected. Following the researches of Widal upon the value of the rate of urea in the blood for prognosis, we were too accustomed to look to the blood for reflections of what occurs in the innermost recess of tissues. His researches, with Weil and Guillaumin, on the determination of uric acid in the blood of gouty subjects, have very often shown that, amongst the most typical gouty cases the determination of the uric acid was most frequently far from revealing the importance of the precipitations in the tissues. It is the same for the Ca in his researches about osteo-arthritis. Whereas there was clear decalcification of the tissues shown by radiography, very often the blood test did not reveal any hypocalcæmia.

One must not forget that in several cases the hypocalcæmia is but momentary. Very soon the regulating mechanism restores the blood to its normal composition necessary to life. Therefore, while we admire the fine work which allows us to account for the metabolism of Ca from a chemical point of view, if Mr. Bezançon had to award presently the palm to one of the research methods, it would be to the old traditional medicine of observation and especially to the experimental science which, in the case of rickets has really been the science of progress, as it has always been elsewhere in medicine.³

Finally, Mr. Plumier (*Ibid.*) draws our attention to the fact that, as there exist uræmic patients without any increase of blood urea, there are also to be found rachitic or spasmophilic children whose calcæmia is normal or decreased. However, this is unusual, and we may say that among the rachitic cases we generally observe a hypocalcæmia, and that in most cases of spasmophilia the rate of Ca in the blood is greatly reduced. We are inclined to believe that improvement in the methods of the determination of Ca, and a more exact knowledge of the states in which it is to be found,

will explain the discordance which we sometimes observe between the results of the blood analysis and the clinical examination. But already we may say that the Ca determination in blood gives us valuable information for the clinical study and the treatment of rickets and spasmophilia.

What else but a lesson of prudence and discrimination can be drawn from this interchange of opinions on the clinical value of certain laboratory analysis, prudence, in the interpretation of the figures given to the clinician by the laboratory; discrimination, in the choice of the analysis pertinent to the diagnosis of a given case. However, we have not much credit for recommending prudence, because it is not of late that we have been aware, as well as European professors, of crises of uræmia without any increase of urea in blood; of glycosuria without diabetes; of syphilis with negative Wassermann, or of positive Wassermann tests without syphilis; of nephritis without albumin; of basal metabolisms above the normal without thyroid symptoms, and cases of rickets with normal calcæmia (supposing that we know what is the normal). Let us be clear.

There was a time in medicine when the *clinic* was everything and the laboratory almost non-existent; that was in a way the extreme opposite of the now prevailing tendency. Our medical knowledge of analysis was then confined to the colour change of the litmus paper, to the search for albumin, sugar, bile, blood and pus; even then we did not always go to the trouble of searching for the two last with the microscope, if only the urine had a normal colour and a clear aspect, because we were ignorant of the hidden hæmorrhages. Evidently, we have to go back some thirty or fifty years to find this situation; this insufficiency of the means of investigation seems to-day deplorable in the light of modern discoveries.

However, skilful clinical medicine was practised. The old masters of the day were close and wise observers. The description of diseases and of their complications given us by Laënnec, Louis, Bouchard, Dieulafoy, Trousseau, Charcot, Bright, Stokes, Addison, Hodgkin, Pepper, Osler and many others, yet remain as models for the younger generation.

Let us not forget the remark of Osler that, by 1840, all the medical world flocked to Paris, renowned for its clinical teaching. Not to go back to masters of contemporary medicine, but

limiting our attention to the men who have been our own teachers, it may be asked if the physician of, say, twenty-five or thirty years ago, with his inquisitive eye (*à la Guérin*) or, his sharp judgment (*à la Rottot*), with much common sense coupled with a fair amount of knowledge, made more errors in diagnosis than are committed to-day, and had less therapeutic success than we have nowadays (surgery, of course, being excepted). Without being too much a "*Laudator temporis acti*" it seems that there is a great hurry to burn idols worshipped for a long time and to lay aside certain methods of examination, diagnosis and treatment, certain therapeutic formulas which have, in expert hands, given wonderful results. But this is a mere digression which would lead us too far.

We are now experiencing the extreme opposite, which may be a change for the worse. There is a tendency to have the diagnosis made by the laboratory. I am not the only one to say this. Did not Dr. Harvey Agnew write in an article entitled: "The relationship of the medical profession to the hospital":⁴ "But now the increasing complexity of diagnosis, our *increasing dependence upon the laboratory* (it is we who emphasize), the increasing cost and technical development of medical and surgical treatment have rendered hospital care almost essential for the full utilization of present-day methods."

Our increasing dependence upon the laboratory.—Why this dependence with all its many disadvantages; among others, the inevitable dulling of the clinical sense of the man who; little by little, accustoms himself to lay upon the others all responsibility of his diagnosis, and the following inferiority, amounting to a relative inability of the physician who finds himself suddenly in a centre where all laboratory help is lacking. Why this dependence? Would it be, by chance, that the results of the laboratory findings are more definite? And yet, very few laboratory analyses furnish us with pathognomonic data. Would it not be rather the attraction of methods which, by their apparent simplicity, tend to relieve intellectual effort and displace the good judgment of the physician? Would it be mere indolence, or fear of some difficulty to be overcome? Would it not be, in certain cases, a want of skill in the clinical examination of the patient which causes many

physicians to accept favourably a ready-made diagnosis coming from the laboratory? Whatever be the cause of this dependence, it exists to a great extent. Does the clinician maintain his proper position when submitting himself too completely to such a practice? Certainly, experimental medicine has made incontestable progress, which we are quite ready to praise. Long ago clinicians began to request the assistance of the laboratory; it was a logical sequence in the progress of experimental medicine. In many cases, unquestionably, the clinician has acquired precision and easiness in the diagnosis; for certain methods of analysis are of indisputable value, provided they be well interpreted. Of course it is not for us, who have been doing laboratory work for the last twenty years, to blame the clinicians who seek help from those methods; we would blame them energetically if they were to do otherwise. But there is a point upon which we would give a warning to the medical profession; it is when we see industry invading the physician's consultation room, putting in his hands apparatus whose practical value has not yet been properly estimated (hydrogen ion concentration outfit, colorimetric determination apparatus, etc.), of which the physician is in no position to control the degree of precision, and of which he has not time to determine experimentally the real clinical value.

The laboratories themselves are hardly free from that commercial invasion, and if they were willing to accept the daily new fads, they would change their metabolism, colorimetry and viscosimetry apparatus as one changes his motor car. We do protest when we see medicine invaded by too absolute formulas, showing a complete underrating of the complexity of the biological working of a living organism, and above all, of the individual variations of the reactions in several organisms submitted to the same causes. To the physicians we say: be cautious, when we see, under pretence of research, the invasion of medical reviews by a mass of hastily prepared work, not sufficiently controlled, with no other effect but to complicate the already difficult task of the practitioner; when we see the invasion of periodicals by techniques in which less than six months after their publication important errors are discovered; when, finally we hear too general and hasty conclusions based on the study

of an insufficient number of cases. The result of all this is to create, in the domain of interpretation of analysis, *chaos*. Chaos! Is that not in some degree the actual situation in which all physicians find themselves, when trying to see through the multiplicity of syndromes?

We mentioned prudence in interpreting the results of laboratory, and judgment in the choice of analysis. Let us now illustrate our proposition by practical examples. Among the laboratory findings there are some that are really pathognomonic, for instance: the presence of spirochaetes in chancre, the presence of Koch bacillus in sputum, a positive blood-culture in septicæmia, a positive 1/200 Widal test in typhoid. These pathognomonic tests are few. I accept them willingly; the clinician who fails to make use of them is guilty of neglect of his patient. On the other hand, does the physician forget that, notwithstanding its pathognomonic character, the Widal test may be negative in typhoid, not only in the first week (which is a classical notion) but also later on, when the organism *defends itself poorly against infection*? Should we therefore decline to make a diagnosis of typhoid because the Widal test is negative? There are other analytical data which, without having as much significance, are however of the greatest value, provided they be rightly interpreted. Take an instance with which we are all familiar, *i.e.*, Ambard's urea coefficient. The laws of Ambard constitute one of the fine discoveries in experimental biology. The resulting coefficient brings to the physician or the surgeon first-class information; between two patients who present a same normal and low figure of urea in the blood, it remains the only means of deciding if there is insufficiency in the elimination of urea. Now, what has not been said on this subject? "The coefficient has no value". That is an absolute statement which proves that the man who makes it knows nothing of the test, or has not practised it long enough to make himself master of the method. We found such an opinion expressed once in a New York clinic, where the coefficient was set aside after a six months' trial. We have been using it for the last seventeen years and it is only after ten years of close observation of the patients that we have been able to grasp the delicate mechanism of its clinical interpretation. Now, another overstatement: "My patient has a coefficient of

0.230; I do not operate." Again the conclusion is too absolute. Our colleague, Dr. St. Jacques has operated for hypertrophy of the prostate, with *success* and *survival* for more than eight years, on a patient in spite of a figure of urea in the blood more than one gram to the litre and an Ambard's coefficient of more than 0.200, at the time of the surgical operation.

Therefore Ambard's coefficient must not be interpreted in an absolute way. We have already written elsewhere⁵ that it was advisable to consider as a whole the symptoms presented by the patient; his arterial blood pressure, his illness, the state of daily diuresis, his general state of health, etc. A ratio of $K = 0.120$ has not the same significance whether the figure of urea in the blood is inferior or superior to 0.500 (expressed in grams of urea per litre); whether a person is suffering from calculus of the kidney or the bladder, from renal tuberculosis or hypertrophy of the prostate; whether the patient be young or old. That is how a laboratory finding must be read; and the production of that figure, far from making unnecessary the examination of the patient, *requires it to be done with the utmost care*. If certain physicians were disappointed by the Ambard's coefficient when it was first employed, it was because they were expecting too much from it. They were making a mistake then in asking too much; some are now making another mistake in asking nothing at all.

We have already written that we do not yet know of any mathematical formula for a precise diagnosis and prognosis. According to an old axiom, there are no diseases, but only sick people. One of the most recent confirmations of that axiom is the study of the colibacilloles. It seems fairly well admitted at the present time that the *B. coli* found in the kidney of a person suffering from pyelonephritis is not always of the same family as the colon bacillus found in the kidney of another patient; whence follows more than ever the principle of auto-vaccinotherapy.

Personally, we warn our pupils continually against too absolute formulas: glycosuria, therefore diabetes; light hyperglycæmia when fasting, therefore diabetes; uræmia* of more than two grams, therefore a likely survival of

* The word "uræmia" has here the meaning that Widal gave it, that is: grams of urea to a litre of blood.

so many months; an Ambard's coefficient over 0.150, therefore no operation; a basal metabolic rate of over +25, therefore hyperthyroidism. Well no, it is not so.

Diagnosis and prognosis in medicine are too complex to be reduced thus to stereotyped formulas. The saying is timely—the figure kills; well interpreted, it might save. How many have we met, in our laboratory career, of these transient glycosurias without clinical symptoms of diabetes, which were caused only be overwork, nervous prostration or worry? How many men of middle age have we known who, at the age of twenty-five, have been refused by insurance companies for glycosuria, and who are still in good health? As in many laboratories and physicians' offices, sugar in the urine was for a long time searched for by a faulty process, how many were not victims of a misunderstood reaction? We may also mention successful operations with an Ambard's coefficient superior to 0.150, and uræmic or acidotic post-operative complications which might perhaps have been avoided if the surgeon had not been too easily satisfied with a summary examination of urine, and if supplementary examinations had been made; also, successful operations on the thyroid with basal metabolic rates of over +50, and deaths in which it was below +40 and *vice versa*.

Why these failures? Because too much attention has been paid to a figure that is liable to error, instead of considering the symptom which should be added to the other symptoms and be interpreted as a function of those. When we studied medicine, we were taught that a specific gravity of 1030 in the urine coincided with the presence of sugar. The first time that we signed a report of analysis in which the presence of sugar was accompanied by a specific gravity of 1010, the physician returned it with the note, "absurd." Proof is made to-day that the specific gravity of urine means very little, unless studied in comparison with one emission to another during the twenty-four hours, and that, in any case, a specific gravity of 1030 is met with in every case where there is oliguria or a higher concentration of the eliminated substances, and especially where an abundant amorphous deposit of sodium or ammonium urate, uric acid or calcium oxalate crystals is found, the

whole without glycosuria being necessarily concomitant.

When we studied medicine, we were taught, almost as a dogma, that in stomach ailments, hyperchlorhydria meant an ulcer and hypochlorhydria, cancer. We learnt to be cautious in the interpretation of the results of gastric juice examinations, on the day when we found stomach cancers with hyperchlorhydria and hypochlorhydria without cancer. Again we were taught prudence the day when we found blood in the gastric juice without any lesion of the stomach; this was in a case of purely liver disease. Also we have frequently found blood in the stomach, in cases of gall-stones.

We were taught to be cautious at a time where the clinical analysis of the blood did not have the importance that it has to-day; when, in former days, we followed the evolution of nephritis in a child by the daily determination of albumin, we saw him die of uræmic coma on the very same day when albumin was disappearing from his urine.

Let us consider the basal metabolic test, since its relation with the affections of the thyroid has been the starting point of the present discussion. We agree with Marcel Labbé that this test is of paramount importance, especially in following the progress of treatment, and to help to settle (but not to impose) the date of an operation, or to modify the medication. But to base the diagnosis of hyperthyroidism on that single test as one might be tempted to do, is widely different and quite wrong. Is hyperthyroidism the only affection in which the basal metabolism is increased? If our readings and personal observations do not lead us into error, an increase of metabolism has been met with in cardiorenal diseases with dyspnoea (+25 to +50); in certain nephritis without œdema (+2 to +29); in pernicious anæmia (+2 to +33); in leukæmia (+21 to +123).

Therefore, when we calmly examine the situation without any prejudice, everything tends to make us put aside the formula that the clinician is exclusively dependent upon the laboratory; on the contrary everything should bring us nearer to the only reasonable formula; *to make out of the laboratory a sixth sense, given to the physician for a better diagnosis of diseases; to make out of the analytical results signs that must be added to the clinical symptoms and*

weighed with them to reach a conclusion, which is the diagnosis. That leads us to discrimination in the selection of analysis; on this we will say but a few words.

First, we do not admit a systematic grouping of analysis before the patient's examination. To do this will unavoidably increase the expenses of the patients who will at last protest, especially if they do not feel any better for it. Neither the physician nor the laboratory worker desire such a state of things. "Tant va la cruche à l'eau qu'elle se casse", says an old proverb. On the other hand, let us not forget that there are actually some most useful analyses, and others which present no practical interest (at least for the time being) except inasmuch as they are connected with the progress of experimental medicine. To the clinician belongs the task of discriminating between both groups. It is evident that the latter have hardly any place in the consultation room; it belongs to the hospital services to use them, and to estimate their value. Those analyses which have not yet proved their real utility, and which remain in the domain of possibilities, have no justification, unless they be accompanied by well made observations, and they be the fruit of a close collaboration between the clinic and the laboratory. To whatever group the analysis belongs, the clinician must appeal to the head of the laboratory to outline clearly before the students the frontiers of that domain.

We are told that one day in a Boston hospital a clinician of the old school, a man of great clinical experience, who did not refuse the help of the laboratory when needed (for he was up to date in medicine), had left his service for a few days in the hands of his interne a young man imbued with laboratory methods. On his return, the clinician asked for news of the week. "There is a case which puzzles me," said the interne. "The patient came to us four or five days ago; I have examined him with several of my colleagues. We have analyzed the urine; we have made a blood count; an examination of the cerebrospinal fluid and a Wassermann test has been negative; we have determined the percentage of the blood urea, of non-protein nitrogen and creatinine; we have taken the arterial blood pressure, etc. But we haven't got any further in our diagnosis. The fellow is feverish and we cannot see why."

"Well," said the master, "let us see the

sick man." On approaching the patient he was impressed by his general appearance. A quick history of the case was gone over in the course of which his attention was drawn to the bowels; a glance at the temperature record, examination of the tongue, the pulse and the abdomen. Then turning to his pupils he said: "Did you remark the facies? Did you notice the character of the pulsation? Did you inspect the abdomen, and find what I see there, the presence of rose-coloured spots? Did you find out such and such a symptom? No? Well, my dear pupils, look well at this sick man. Wherever you find the group of symptoms which I just indicated, be sure it is typhoid. Have a Widal test made; all your other analyses have no interest for the time being;" and the "sero" was positive.

The story might have been a joke, but it depicts well what would be the situation if the clinic should place itself under the dependence of the laboratory. Let us conclude.

We have proved that between two extreme positions, namely complete abstention from the laboratory and excess in the use of it, there is room for a golden mean—discernment in the choice of analysis. At the present day, to know how to make use of the laboratory is not given to all practitioners, and that knowledge does not come in six months or a year. To interpret rightly the results of the laboratory in view of the diagnosis, to choose with judgment the analysis which bear upon the case, requires an analytical mind coupled with a vast clinical training.

The possession of an analytical mind must rest upon a firm secondary culture, the fruit of the harmonious study of classical humanities and sciences, natural, mathematical and physiochemical. This broad training characterized the old masters of England and France whose names we have mentioned. Thorough clinical training can be assured only by a prolonged practice, by an early stay in the hospitals during which the student has an opportunity of developing his powers of observation, already directed in the course of the pre-medical year, to the problems which will confront him at the patient's bedside.

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FOCAL INFECTION AND ITS RELATION TO DISEASE*

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II.

NOWADAYS, if a lecturer in speaking of the treatment of any disease mentions that "of course all foci of infection should be removed", his remarks are liable to be received by low moans of distress from his audience. The wholesale eradication of teeth, tonsils, gall-bladders, etc., on the slightest provocation has not led to any great benefit, and the pendulum is tending to swing so far in the other direction that it will soon be a difficult matter to convince the profession that their previous theories were anything but fallacious, and still more difficult to persuade the public to submit further to these methods of eradicating disease.

The theory of focal infection as a cause of disease is in a fair way to become discredited by misplaced zeal on the part of our profession. We have been prone to overlook the following facts:— (1) A focus of infection may truly be present, but not the cause of the disease of which the patient complains. (2) The focus of infection may be the cause of the disease and yet be removed too late to affect beneficially the already firmly seated disease. (3) Many people with a neurotic tendency and a hypersensitive sympathetic nervous system complain of symptoms which have no organic origin, but which disappear quickly, although only temporarily, as a result of the extraction of teeth or the removal of tonsils. This causes a wave of unjustified optimism on the part of the physician, followed by one of pessimism when these patients return to upbraid him in sentences broken by grief and the clicking of unaccustomed dental plates.

That the removal of a focus of infection will frequently benefit a patient is unquestionable; we have all seen enough of these cases to grant this fact. Also, we have been unfortunate witnesses to the fact that symptoms have been markedly aggravated by surgical treatment of

the suspected focus. Therefore, we may say that we believe in the theory of "focal infection", meaning that we consider it possible that a focus of infection, consisting of a circumscribed lesion of bacterial nature, is capable of disseminating its infection to contiguous or non-contiguous parts. We may support this view without necessarily subscribing to Rosenow's theory of elective localization.

In dealing with the problem in a general way a pinch of common sense is valuable seasoning. The loss of a pair of tonsils is soon forgotten; the extraction of one or two suspected teeth creates merely a gap which the dentist can fill; the massage of a prostate is more an undignified than a terrifying ordeal to the patient. Such procedures as these then may be freely advised as a source of possible relief for a mild systemic infection. The situation, however, must be much more serious, and the patient and doctor ready to try almost anything for relief, before sound-looking teeth are sacrificed wholesale, accessory nasal sinuses excavated, and gall-bladders removed. Relief is relative, and a patient who has suffered from intractable and constant asthma, from which he obtains relief by radical sinus surgery, will not complain of any subsequent nasal discomforts.

Let us consider one or two of the sites of infection in detail.

Teeth.—The mouth is full of bacteria at all times and in spite of nightly admonitions regarding film-removing dentifrice, our teeth frequently become infected. The gums are generously supplied with blood, the gingival epithelium is delicate and easily broken, and the trauma of mastication, especially in the case of loose teeth or malocclusion, interferes with a possible curative process such as might occur in more immobile parts of the body.

Dental infection may be divided arbitrarily into two main types, that which is evident to the inspection of the trained observer, *i.e.*,

* This is the second article published in the Periodic Health Examination Series. For the first see *Canad. M. Ass. J.*, 1931, 24: 407.

caries, gingival disease, etc., and that which can only be recognized by x-ray or by inference. By inference is meant the probability of infection of a devitalized tooth. The x-ray examination is by no means the final word in the diagnosis of dental infection. It may not show a root which has apical absorption, nor does apical absorption necessarily indicate that true infection is present. Now dental infection is usually the result of a streptococcus and it might be argued that if this infection is being carried by the blood stream it should be possible to demonstrate these streptococci elsewhere in the body. Such is not necessarily the case. Toxins only from an infected tooth may be the cause of the systemic disturbance, and these toxins may cause an anaphylactic reaction on the part of certain tissues, which will then present a clinical picture comparable to that produced by other recognized anaphylactic reactions.

An important factor in dealing with dental infection, as with focal infection elsewhere, is the family history. Once an individual has passed the age of common infections and accidents, his ability to live to a ripe old age depends on his systemic defence to the degenerative diseases, such as chronic nephritis, myocarditis, and arteriosclerosis. Certain families undoubtedly exhibit this defence mechanism to a high degree, and members of them are frequently pointed out as examples of the fallacies of the theory of focal infection, in that they have bad teeth, bad tonsils, infected gall-bladders, and so forth, and yet are not affected by them. This merely proves that focal infection is harmless in the individual with high resistance, but does not disprove the fact that those individuals with a poor family history of longevity are particularly prone to suffer. Dental infection, moreover, is not merely a local process. An individual with mild dental infection may suddenly develop local evidence of a spread of the condition as a result of a breakdown of the general health from overwork, worry, undernutrition, and so forth. The lesson to be learned from this is that in these cases it is often wiser to attempt first to build up the general health, in order to check the spread of dental infection, than to extract the teeth first in order to benefit the general health. This applies chiefly to young

people, to whom the loss of many teeth is a much more serious matter than to the old.

As has been said before, the x-ray is not a reliable guide in regard to the necessity of tooth extraction. It will, however, show two important things, whether a tooth is devitalized, and whether there is bone condensation surrounding the rarefied area at the apex of any given tooth. Devitalized teeth, even with careful root filling, will prove to be infected in about 75 per cent of cases. This may be due to the fact that a dead tooth assumes the nature of a splinter or foreign body and is therefore eventually the site of a process of local indignation on the part of the tissues. Condensing osteitis is stressed, as, in my experience, it indicates a condition of poor defense.

In a given case of suspected focal infection of the teeth what should we do? Send the patient to the dentist for the treatment of any gingival infection or malocclusion; build up the general health if indicated; have an x-ray picture taken to see the number and appearance of devitalized teeth and evidence of bone condensation; extract one of these teeth for study and bacterial examination. Then take into consideration the number of teeth you may have to condemn, the age of the patient, the family history, the type of systemic infection you fear, and its probable dangers to the individual if the condition is unchecked. Balance all these factors and let your conscience be your guide.

Tonsils.—The controversy concerning tonsillectomy is not quite as bitter as that regarding the extraction of teeth for focal infection, for evident reasons. First, the loss of the tonsils is not so serious a matter; and, secondly, the tonsil, consisting of lymphatic tissue with open crypts, is inevitably, after the first years of life, potentially infected. Moreover, this infection has direct access to the blood stream, as has been shown by the occurrence of leucocytosis and increase of systemic disturbance following tonsillar massage. As the latter mechanism occurs to a moderate degree with every act of swallowing, it follows that the entry of streptococci to the blood stream must be an easy and unavoidable process. Some arguments against tonsillectomy are based on our lack of knowledge regarding tonsillar function, the probable effect on growth and on the endocrine system in the growing child of the tonsil, and its

probable rôle as a barrier to infections. It may be that those parents who proclaim against interference are those who realize that the modern idea which demands that the child be tonsillectomized, circumcised, immunized, and generally revised, is making life very difficult.

With the adult the situation is different. The individual who complains of a feeling of thickness in the throat, who has frequent sore throats or colds, or who suffers from a systemic disease which might be due to infected tonsils, should have the latter removed. If the tonsils look unhealthy they should come out. If there are no local signs but a history of frequent attacks of sore throat tonsillectomy is again indicated, as in this case the frequent attacks of inflammation with subsequent fibrosis may have contracted the organ, closed the crypts, and left the systemic circulation as the only possible drainage exit.

In my own experience the only persons who have complained of the evil effects of tonsillectomy on themselves are either those who prize a grievance or those whose throats suggest that the tonsils have been removed by means of a niblick.

Other foci.—There is a possibility of a diseased gall-bladder, appendix, prostate, or other organs causing a systemic infection, but space does not permit of dealing with these in detail. They are less common causal factors and not so productive of professional quarrels. There is, however, one type of infection, not as yet mentioned, which is difficult to discuss—infection of the accessory sinuses of the nose. Chronic nasal catarrh is so common and so distressing as to be a problem in itself without regard to the question of focal infection. One occasionally listens to a patient's account of his relief of arthritis from sinus surgery but, while congratulating that patient on his cure, one keeps carefully to windward during the conversation. Moreover, the conflict of rhinological opinion makes difficult the evaluation of this type of surgery. One specialist recommends for the relief of focal infection a form of surgical intervention which another would not condone under any circumstances. We cannot then, as yet, advise the victim of chronic catarrh who, at each cold season, might so aptly paraphrase the poet with, "Blow, blow ye winter winds; your blowing causes less disgust than mine."

PHYSIO-THERAPY: MODUS OPERANDI

BY THE PUBLICATION COMMITTEE, CANADIAN RADIOLOGICAL SOCIETY

III.

ADMITTEDLY, the favourable reaction of the malarial patient to adequate dosage with quinine is the result of specific treatment. Other examples might be given. When, however, one analyzes diseases generally we are impressed with the fact that we have few specifics and that we must, to a large degree, depend upon symptomatic, supportive, or expectant treatment. In consequence, the enlightened physician recognizes his sheet anchor in *vis medicatrix naturæ*.

In previous articles it has been stated that, properly used, with full knowledge of physiology and pathology, physical therapy can be used to the advantage of the patient and to no small degree the results predicted. If this be true, scientific physical therapy is not, as sometimes described, purely empirical. With the discovery of x-rays by Roentgen in 1895 and

the radioactivity of matter by Becquerel in 1896, intensive study of the atom began. With such vigour has this study been pursued that we now know that the atom is divisible into two components, protons and electrons. The centre of the atomic "solar system" consists of a definite, positively charged, electrical mechanism—the proton. Arranged around the proton are varying numbers of orbits in which oscillate negative electric charges or electrons. These vary in number and arrangement in various atoms and give to them specific chemical and physical properties. In a normal state of equilibrium these negative charges neutralize the positive charge, so that the atomic system is in consequence electrically neutral.

It is well known that the electron can be displaced from the atom. The characteristic peculiarity of radioactive atoms, such as radium,

is explained by the fact that they readily part with their electrons, and this fact accounts for a constant discharge of energy therefrom, which science has minutely studied and described as due to alpha, beta and gamma rays. Each ray possesses certain demonstrable characteristics peculiar to itself. The production of x-rays, the short wave lengths of which indicate a close resemblance to the gamma ray of radium, is closely related in some particulars to the activity of radium. An electron discharge from radium gives rise to the beta ray and an electron discharge through the x-ray tube gives rise to x-rays, or radium-like energy.

In 1901 Becquerel learned that radioactive substances could not be carried around on one's person safely. He personally experienced an erythematous reaction because of such a mistake, and thus began the study of short wave length energy from a therapeutic viewpoint. These energies are used to destroy cell function and even cell life, to inhibit cell function, or to stimulate it. These powers are at the service of the radiotherapist who understands their manipulation and control. To treat malignancy, we take advantage of their lethal property whereby cell structure and function may be destroyed. Used in a less intensive manner, we can inhibit gland function. This is illustrated in the successful radiation treatment of toxic goitre and the hæmorrhages of the menopause. The stimulating effect is used to advantage in functional amenorrhœas and in treating many chronic states, the result of local disordered circulation, stasis or fibrosis.

But what is the *modus operandi*? Short wave length energy directed into tissues (aggregates of atoms intimately grouped) causes, as science has shown, an emission of electrons. The tissue atom having lost a portion of its negative charge is no longer stable; it is now chemically active (photo-electric effect); thus is secured chemical change in the tissue. These photo-electric and photo-chemical changes are quite familiar to every student of physics. These changes may be to the advantage or to the detriment of the organism according to the duration and intensity of the delivered radiation. The dosage is capable of variation at will according to the design of the therapist. To be helpful to the patient, it necessarily follows that the patient's pathological state must first be thoroughly

estimated. This necessity removes radiation therapy from the charge of empiricism.

It is not the purpose of this paper to discuss in detail the physiological reaction of the organism to short wave length radiation, but it is interesting to note that the normal cell is not unlike the atom in some particulars. While physiologically most complex in its many and varied relations, the cell, like the atom, has an electro-positive nucleus or centre, and its cytoplasm is electro-negative. Variations of electric potential in the cell undoubtedly accounts for much of cell function. The full explanation of these biophysical and biochemical processes is still far from clear, but is ever gradually unfolding. Their perfect elucidation will unravel the action of short wave length energy in its entirety.

It is now definitely held that the essential difference between the action of gamma radiation, on the one hand, and that of, say, ultra-violet radiation, on the other, is one of a varying degree of violence of action experienced by the atomic structure. A long wave length such as that of the ultra-violet ray causes discharge of electrons from the outer atomic orbit, and the gamma ray expels electrons from the inner atomic organ. The former radiation produces in the end primarily beneficial effects; therefore, this radiation is spoken of as *biotic*. Creating more disorganization in the atom, gamma radiation produces a more profound effect and tends to be lethal. This type of radiation, then, is spoken of as *abiotic*.

All light energy falling on a tissue is not active; part is transmitted. To be active there must be absorption, and this involves a transformation of energy. In radiating tissues, this transformation is readily established, and secondary radiation, longer wave length energy, is seen to evolve, which in turn bombards surrounding atomic structures, producing thereby electronic disruption, which again results in further chemical change.

The histological appearance of radiated tissue is well known. A definite inflammatory reaction follows a definite latent period, the latency undoubtedly being due to the chemical origin of the reaction. Time is required after the atomic commotion to evolve the chemical mechanism that brings the reaction into being. Depending to no small degree upon the in-

tensity of the radiation varying types of reaction appear. Single fractional and prolonged dosage all produce varying reactive changes. There may be a restoration apparently to comparative normality after a radiation dosage, or, if the cells irradiated have been destroyed, a repair is effected and fibrous tissue laid down in the area.

It is well recognized that many tissues are more sensitive than others. The cell of embryonic type, and the endothelial cell are particularly sensitive and readily destroyed by radiation. The same is largely true of cells undergoing mitosis and cells with hyper-metabolic function. It is also well known that bone, muscle and nerve tissues are more resistant to radiation. Similar variation in sensitivity and resistance is found in new growths. The anaplastic cellular tumour is most sensitive; the osteosarcoma is most resistant. The type of stroma in association with the cell must then also be recognized if one is to efficiently dose diseased structures and adequately prognosticate as regards the outcome.

From these considerations, it will be seen that radiotherapy is capable of being described in terms of physics. This, in turn, can be trans-

lated into known physiological response. The aim of all therapy is to restore normal physiological function which has become disturbed by some unfavourable factor—local, general, or extraneous.

Profiting by intensive trial and failure, gradually a system of application has evolved that has a very wide range of application. Briefly stated, radiations, properly utilized, are capable of destroying, inhibiting, or stimulating the cell function, depending upon the dosage. Inflammatory reaction of minimum to maximum intensity can be produced in the tissues at any depth, and full advantage is taken of this in many chronic disabling types of disease. Minimum reactions maintained appear to control the accumulation of local exudates and fibrous tissue formation. Existing fibrous tissue can apparently be dissolved to no small degree. Radiotherapy properly applied involves a knowledge of physics, physiology, and pathology. The proper application of these measures to disease is capable of explanation and understanding, and is, therefore, specific-like in action. In a succeeding article, the mode of action of other physical agents will be considered.

THE ADMINISTRATION OF SALICYLATES

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IT is well known that the large and repeated doses of salicylates given in cases of acute rheumatism often upset the patient's stomach. It has been supposed that this is due to the liberation of salicylic acid from the salicylate by the hydrochloric acid of the gastric juice. Hence the drug is frequently given with sodium bicarbonate, which is intended to neutralize the hydrochloric acid. A mixture of sodium bicarbonate and salicylate has a very unpleasant taste, and, consequently, these salts have been given in capsule or in powder rapidly washed in with a little water. Capsules have the great disadvantage that their dissolution liberates the salts in a concentrated form, spread over but a

small gastric area, and hence there is even greater danger of gastric irritation. Hence, it is preferable to give such salts in solution, to be taken in a diluted form.

A solution of sodium salicylate and bicarbonate darkens rather rapidly in colour, owing to chemical changes which are not well understood. Druggists report that the patient does not notice the gradual change of colour in his mixture, but at once notices that a new bottle is not the colour of his last dose. This difficulty may be overcome by the use of the following prescription, in which the dark colour imparted by the liquorice obscures the colour change. Such a mixture will not keep indefinitely. It should, indeed, not be kept longer than a week.

R	Sodii Salicylatis		
	Sodii Bicarbonatis	aa	gr. xx
	Extr. Glycyrrhizæ Liq.		mm. xx
	Syrupi		3 i
	Aquæ	ad	3 ss

All the bicarbonate will not be in solution.

The only other flavour that provides adequate cover, in our experience, is the Compound Syrup of Sarsaparilla (U.S.P.)

Some recent experiments of Mr. Gerald Bales, carried out at our suggestion, have thrown some light on the cause of the discolouration. He has found that some of the salicylate is attacked and disappears, and that some phenol appears in the mixture. The amount altered is small, less than 4 per cent in several months. It has been known for some time that the addition of a small amount of sodium thiosulphate will largely prevent the discolouration, and Mr. Bales has evidence that this is due to a prevention of the reaction leading to discolouration rather than a bleaching of the coloured compound by the thiosulphate. This, then, appears to be another method of preventing the development of colour and permits the use of other than dark flavourings; but, in our experience, if sodium bicarbonate is used, the two flavourings mentioned are much the best.

As we have pointed out in a preceding article (*Canad. M. Ass. J.*, 1930, 24: 77), sodium bicarbonate is not the ideal gastric antacid, and experiments have shown that the objectionable colour change is much slower with calcium

carbonate or with magnesia, and is much more readily prevented by thiosulphate. Further, both the calcium carbonate and magnesia, owing to their insolubility, are nearly tasteless, and sodium salicylate combined with them can be more easily covered. Consequently, we would recommend to the consideration of physicians the following prescriptions:—

R	Sodii Salicylatis	gr. xx
	Magnesia Levis	gr. vi
	Sodii Thiosulphatis	gr. ss
	Syrupi Sarsæ Co. U.S.P.	3 ii
	Aquæ	ad 3 ss
To be taken diluted four times with water.		

R	Sodii Salicylatis	gr. xx
	Calcii Carbonatis	gr. xii
	Sodii Thiosulphatis	gr. ss
	Syrupi Sarsæ Co.	3 ii
	Aquæ	ad 3 ss
To be diluted four times with water.		

The dilution of these prescriptions is necessary to make them palatable. The first will be more laxative than the second.

R	Sodii Salicylatis	gr. xx
	Calcii Carbonatis	gr. xii
	Sodii Thiosulphatis	gr. ss
	Syrupi	3 i
	Aquæ Menthæ Piperitæ	ad 3 ss
Dilute four times.		

This last forms quite a palatable mixture. Magnesia can be substituted for the calcium carbonate. These four prescriptions contain enough base to neutralize about 200 c.c. of normal gastric juice.

IDIOPATHIC DILATATION OF THE ŒSOPHAGUS.—F. A. C. Scrimger describes idiopathic dilatation of the Œsophagus, cardiospasm, or achalasia cardia as being second only to cancer in frequency of diseases of the Œsophagus. Idiopathic dilatation occurs most often in the thoracic portion, and signifies a diffuse enlargement of the lumen of the Œsophagus; the abdominal portion below the diaphragm is not dilated, but is usually thickened and contracted. The Œsophagus is also elongated, and may measure up to 46 cm.; it may contain from 1,500 to 2,000 c.cm. of fluid. The wall becomes thickened, and the mucosa frequently inflamed, friable, or ulcerated. It is suggested that the disease is secondary to degenerative changes in the vagi, the closure of the cardia being due to the normal tone acting without nerve control. The condition usually develops before the age of 40; the onset may be sudden and progression intermitted, the chief symptom being difficulty in swallowing and the regurgitation of large quantities of frothy food mixed

with saliva. Two cases are reported in which extra-mucosal Œsophagoplasty was performed; in one of these the patient made a good recovery, with satisfactory results a year after operation; in the other case the patient died from a mediastinal infection. In a third case, operation consisted in the exposure of the cardiac end of the stomach through a Marwedel incision, the cutting of the coronary ligament of the liver, and the turning downward and to the right of the left lobe of the liver, thus exposing the cardiac end of the stomach and the subdiaphragmatic portion of the Œsophagus. An incision was then made forward through the crura of the diaphragm, the dilated portion of the Œsophagus being brought the opening for at least an inch. This operative procedure avoided the danger of tearing the Œsophagus; a risky suture is obviated. In the case so treated recovery was smooth, and soft food could be swallowed after the usual lapse of time.—*Arch Surg.*, 1930, 21: 1315.

Clinical Conferences

THE ACTION OF RADIUM ON CARCINOMA

A Clinico-Pathological Conference at the Montreal General Hospital

THE regular weekly clinico-pathological conference at the Montreal General Hospital, on December 4, 1930, was devoted to the consideration of some of the effects of radium on carcinoma. The material presented by Dr. L. J. RHEA was the tissue from two cases of carcinoma which had been treated by irradiation with radium, and the discussion opened up points of great interest.

Dr. A. T. BAZIN, who had been in charge of the patients, first gave the clinical details, as follows:

CASE 1

A spinster, aged 66, was admitted on July 27, 1930, with a scirrhus carcinoma of the left breast. She said that she had discovered the lump four months before, but the growth had probably been of longer duration than that, for it had invaded the whole of the breast, was extremely hard, and was of the slow-growing type. The skin showed involvement, and was of a shiny mulberry red, suggesting early ulceration. The pectoral chain of axillary glands was palpably enlarged and very hard. There was no evidence of metastasis to the infra- or supra-clavicular glands or to any other region.

Irradiation was chosen as the method of treatment because radical operation in this thin type of patient, with inelastic skin, usually means sloughing and prolonged convalescence, with permanent limitation of movements of the shoulder joint from cicatricial contraction.

Radium element in platinum needles of 0.7 mm. wall thickness was used, these being implanted as a grid beneath the breast, in front of and behind the axillary glands, in the infra- and supra-clavicular spaces, and in the anterior extremities of each of the upper four intercostal spaces. In all, 33 mg. of radium were used, for a period of 7 days, a total of 5544 mg. hours.

One month later the breast mass had shrunk considerably, the skin was no longer tense but wrinkled, and the involved axillary glands had completely disappeared. But two months later the breast mass had again increased in size, and a simple mastectomy was performed.

Dr. RHEA then took up the pathological aspect of this case. He showed the breast material obtained from the operation, and described how, by special cutting methods carried out by Dr. Pritchard, it had been possible to obtain sections through the entire extent of the breast. The points in which Dr. Rhea had been particularly

interested were these: (1) Had any fibrosis been produced by the action of the radium? (2) What had been the result of the irradiation on the cancer cells?

After careful search throughout the specimen, and by the use of special staining methods, he felt justified in saying that there was no more fibrosis throughout the specimen than one would have expected to find in an ordinary untreated carcinoma of the breast. Radium, therefore, in this case apparently did not stimulate the production of fibrous tissue. As to the result of irradiation on the cancer cells, he could only say that if the specimen had been submitted to him without his knowing that radium had been used in connection with it he would not have had the least suspicion that it had received irradiation. In other words, it was impossible for him to see any specific changes in the tumour cells. As far as he could make out, they presented the same characters as those seen in untreated cancer of the breast. He pointed out, however, that he had no special knowledge as to what changes went on in the cancer cell two months after irradiation of the involved tissue. The limits of the tumour were sharper than is usually seen in large carcinoma of the breast. The fat showed only marginal infiltration, and none of the sections showed tumour cells in the lymphatics. In searching for changes in the tumour cells in both the cases under consideration it should be remembered that a considerable time had elapsed since the radium was applied to the tumour.

At this point Dr. BAZIN commented on the fact that the growth showed such definite clinical improvement at first, as judged by its shrinkage, whereas, when it came to the time of operation it was apparent that this improvement could only have been temporary, and that the progress of the carcinoma was continuing in a very disappointing degree.

However, before discussing the various aspects of radium therapy, he presented another case in which radium had been used, and in which it had been possible to observe the effects from the beginning.

CASE 2

This was a man of 38, with carcinoma of the rectum. He had complained of increasing constipation for about one year, with bleeding on defecation, of six months' duration. The proctoscope revealed at the recto-sigmoid junction an annular ulcerating and obstructing carcinoma, with some degree of attachment to the bladder structures.

The patient was referred to a surgeon in London, who had a vast experience in rectal carcinoma and some years' experience with its treatment by radium. A laparotomy showed the cancer to be free of evidence of metastasis, and in a favourable position for radical removal. Irradiation was instituted by means of needles and a temporary colostomy established, after which the patient returned to Canada. Convalescence was impeded by the development of active tuberculosis in the left lung, which however, was brought well under control by proper treatment. Eight weeks after the beginning of the irradiation proctoscopic examination showed a normal bowel mucosa and mobile wall, except for a shallow ulcer 1.5 cm. in diameter on the right lateral aspect of the site of the original lesion. The general condition was excellent and the patient put on weight satisfactorily.

About two months later, however, it was found that there was a polypoid mass filling the hollow of the sacrum, ulcerated and bleeding at the slightest touch. On cabled advice from London the abdomen was opened for a resection, but the extent and fixity of the mass made this impossible. Radium was again resorted to and on three occasions, 50, 25, and 125 mg. tubes were employed, both from below and from the colostomy opening. But later on there was evidence of involvement of the bladder wall, and eventually, (five months from the time that he was first seen by Dr. Bazin), acute intestinal obstruction developed and mercifully brought an end to the patient's suffering.

DR. RHEA then went over the microscopical features of the material obtained from this case, and again dwelt on the fact that it was in no respect to be differentiated from carcinomatous tissues which had not had radium treatment. All he could say was that the growth showed the ordinary typical characters of adenocarcinoma. He thought that with these two cases before us it would be of great interest to review some of the present opinions on radium treatment of cancer, and asked Dr. Bazin for his comment.

DR. BAZIN said that in a general way we had lost a good deal of the extreme enthusiasm which first attended the employment of radium in cancer. That it was a valuable form of *treatment* there was no gainsaying, either as an adjunct to surgery, or as an alternative procedure. We were beginning now to assemble groups of cases which had been treated with radium for five years or more and to compare them with other groups in which surgical measures alone were employed. He spoke of

such groups having been collected by Gask and others in London, and of course there were many in other centres. The comparison did not bring out any marked advantage in favour of the radium. But this did not mean that there was no particular value in its use. For example, in the first of his two cases mentioned above, he thought that the radiation applied to the breast at first had greatly aided in checking the growth for a time, as shown by the shrinkage.

DR. E. M. EBERTS then mentioned that the Mayo Clinic had recently published observations on over 2,500 cases of cancer in which radium had been used, and had drawn the conclusion that the results have by no means been more encouraging than those obtained by surgical measures alone.

DR. RHEA pointed out, however, that certain forms of cancer apparently do yield very encouragingly to irradiation. Whether this was a question of greater accessibility and susceptibility he was not prepared to say. Rodent ulcer was of course one of the best examples.

DR. ELEANOR PERCIVAL, of the Department of Gynaecology, said that since the introduction of radium treatment of carcinoma of the cervix, most encouraging results had been obtained, and that this method of treatment had almost completely replaced the operative treatment of this condition in this hospital. It was difficult, although this was highly satisfactory, of course, to obtain fresh specimens of this form of cancer for teaching purposes in the pathological department.

DR. P. G. SILVER then asked whether it was not true that after an initial treatment with radium the patient's tissues might become radium-resistant, so that subsequent irradiation might be ineffective.

DR. RITCHIE, roentgenologist of the hospital, said that the lack of satisfactory response of tumour cells under certain conditions to either x-rays or radium was well recognized, but no satisfactory explanation had as yet been offered for this. The consensus, however, was that the more embryonic the tumour cells were, the more satisfactory was their response to x-ray or to radium.

Case Reports

A CASE OF ATROPHIC CIRRHOSIS OF THE LIVER IN A GIRL AGED ELEVEN AND ONE-HALF YEARS

By STANLEY M. ASSELSTINE, M.D.,

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Atrophic cirrhosis of the liver in childhood, especially when associated with unusual symptoms, is sufficiently rare to justify a report of the following case.

Family history.—not relevant.

Personal history.—A.O., a girl aged 11½, was first seen by Dr. Geo. W. Rogers, of Essex, on November 5, 1930. At the age of two months the patient had to be put on bottle feedings, and from that time up to the age of six months had had a rather stormy time with feeding difficulties. From the age of six months up to five years she was apparently a healthy child. At the age of five years she developed measles, but the course of the disease and recovery was uneventful. She started to school at the age of seven and was in the senior third grade at the time of death. At all times she appeared in good health, and at school was very active in sports, etc. Alcohol, either as alcohol itself or in the form of patent medicine, could be eliminated as a causal agent in this case. According to the family physician, the child had never taken a bottle of medicine during her lifetime.

On November 5, 1930, on rising, the girl complained of not feeling well, lay down for half an hour, and then started vomiting. On getting up she vomited pure blood with many clots (approximately ½ pint). She was put to bed during the day and in the evening got up, and two hours later vomited about ½ pint of blood. The following morning she vomited again about the same amount. A bowel movement was very tarry.

On November 6, 1930, at 10.30 a.m. the child was admitted to hospital; temperature, 100°; pulse, 136; respirations, 26; weak but rational.

Physical examination.—A well-nourished girl. The heart sounds were weak, rate 136; no murmurs; no irregularity. The lungs were negative; the abdomen, slightly distended; head

and neck negative. On account of the recent hæmorrhage the examination was very superficial. Blood count: red blood cells, 1,956,000; white blood cells, 15,875; polymorphonuclears, 78 per cent; small lymphocytes 16 per cent; large lymphocytes 6 per cent. Urine: acid, 1020, no albumin, no sugar, many hyaline casts, few leucocytes. The Wassermann test was negative.

On account of the patient's condition she was given saline and glucose, and typed for transfusion. On November 7th, at 3 p.m. she suddenly became nauseated and tried to vomit. The pulse was very weak and thready. A transfusion of 200 c.c. of blood was given; the patient was very restless and delirious; a slight improvement in colour, otherwise negative.

November 8th, the patient was very restless, with a weak and thready pulse. A transfusion of 200 c.c. of citrated blood was given. For a short time she seemed to improve, then became delirious, and later semi-comatose.

November 9th, her condition was poor—pulse weak and thready, rate 150; slight rigidity of neck. Tonic spasms of the muscles came on periodically and lasted about two minutes.

On November 10th, the condition was worse. Lumbar puncture showed increased pressure, and gave a clear fluid showing no increase of globulin or sugar. The Wassermann test was negative.

November 11th, her condition became gradually worse and she expired at 2.30 p.m.

Autopsy.—A well-nourished female child about the age stated; subcutaneous fat was plentiful. There was considerable œdema in the dependent parts.

Both pleuræ were normal, except for a small amount of clear fluid. Both lungs showed hypostatic congestion. The heart was of normal size and without apparent abnormality.

The abdomen contained about one pint of clear straw-coloured fluid. The liver was about half the normal size, the edges very sharp, and the surface irregular and nodular. The left lobe was very thin, atrophic, cutting with considerable resistance (leathery appearance), in colour yellowish-green.

Microscopically there was marked perilobular

fibrosis, with considerable round-cell infiltration. The bile ducts were increased, and there was a marked tendency to a cystic condition. There was also considerable bile staining of the liver cells. (See Figs. 1 and 2.)

The spleen was enlarged to about twice the normal size; the blood vessels were congested.

called Banti's disease and "idiopathic non-alcoholic progressive hepatic cirrhosis". He stated that in the former, the morbid process is located mainly in the spleen. Sutton³ in a recent article reports a case of atrophic cirrhosis in a child of 10 years and from an exhaustive study of the literature has been able to dis-

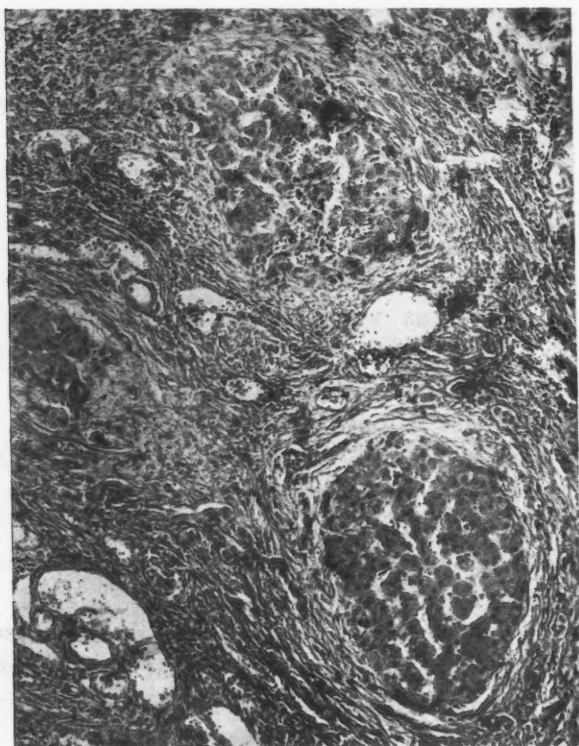


FIG. 1

Hyperplasia of the splenic cells, with many areas of hyalinization, was noted.

The glands extending from the spleen towards the liver were markedly enlarged (to the size of the end of the thumb), of dark red colour. Section showed fibrosis and hyperplasia.

The stomach was of normal size, and contained a small amount of blood-stained material. The blood vessels, especially those on the lesser curvature near the cardiac end, showed a marked hæmorrhagic condition.

The intestines were normal, except for the presence of partially digested blood.

The kidneys and other organs were normal.

Many cases of atrophic cirrhosis have been reported in Great Britain and on the Continent in which alcohol has played a large factor. Rolleston¹ has stated that among 16,100 necropsies at St. George's Hospital from 1865-1918 there were 12 cases of portal cirrhosis in persons under 21 years of age. Weber² has emphasized the intimate clinical connection between so-



FIG. 2

cover only 12 other reported cases in the American literature.

James E. Davis,⁴ reports that in many cases of polycystic kidneys there is a polycystic condition of the bile ducts of the liver. The pathological picture in these cases is very much the same as in the case here reported. Even in spite of the lack of any macroscopic cystic condition of the kidneys here there is a probability that the condition is congenital. The patient was able to carry on 11½ years, and then suddenly succumbed on account of some infection plus gastric hæmorrhage. We know that this may be the case in congenital polycystic kidney, therefore it is not inconceivable that the same course of events may have happened in this particular case. On the other hand, there may have been liver damage produced from improper feeding between the ages of two and five months, with later a gradual fibrosis and portal congestion culminating in hæmatemesis and death.

In view of the sudden attack and rapidity of

this case it is practically impossible to rule out Banti's disease, but, because of the greater amount of pathological change in the liver and the fact that the only glands affected were in the portal region, I am of the opinion that this is a case of primary atrophic cirrhosis, with secondary involvement of the spleen and glands.

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THORACOPAGUS MONSTER DELIVERED BY CÆSAREAN SECTION

BY P. W. HEAD, M.D.,

Birtle, Man.

On December 20, 1930, Mrs. X., was admitted to Birtle Hospital. She was a multipara, eight months pregnant, and had been in labour for three days before admission. There had been no pre-natal care.

On admission, her temperature was 99.2°; pulse, 92. External examination revealed an enormously enlarged abdomen, with extensive œdema of the hypogastric area. The uterus which could be well mapped out was enormously enlarged and so tense that no fetal parts could be palpated nor could any fetal heart sounds be detected. No vaginal examination was made.

From her history and physical findings a tentative diagnosis of hydramnios due to malformation of the fetus was made. On the strength of this diagnosis and the condition of the uterus Cæsarean section was considered the best method of treatment. The patient was therefore prepared for immediate operation.

I performed the classical type of operation. Aseptic ergot, 1 c.c., was given intramuscularly just before the skin incision was made. On opening the uterus about two and a half gallons of liquor amnii escaped. The feet of the fetus presented in the wound and extraction appeared as if it would be easy. However, such was not the case. On passing the hand into the uterus the impression given was that of locked twins. The uterine incision was enlarged and delivery was completed, when it was found that we had a monstrosity in the form of Siamese twins (thoracopagus). The operation was then

completed in the usual way. The total time taken was thirty minutes. There was no abnormal hæmorrhage.

Examination of the twins, which were of the female sex, showed them to be perfectly developed in every way, with the exception of the place of union, which extended from the clavicles to the umbilicus. There was only one umbilical cord. They lived fifteen minutes after delivery.

The mother did well and was discharged on the fourteenth day in good condition. The twins were sent to the Anatomical Museum of the Manitoba Medical College.



FIG. 1

The specimen examined by us (J.L.J. and G.I.B.*) was a double monster, the two individuals being united from the suprasternal notch down to, and including, the umbilicus, and being placed almost symmetrically opposite. On the side opened up by dissection, there were osseous nodules present in a common sternum, while on the opposite side the two individuals were united by costal cartilages. The crown-rump measurement was 21.2 cm. and the transverse measurement between the occiputs 20.5 cm. The monster weighed 6 lb.

* Report by J. L. Jackson, M.A., M.B., and G. L. Boyd, F.R.S.C.E., Department of Anatomy, University of Manitoba.

Dissection showed in the common thorax a single heart giving origin to a pair of aortæ, and behind the heart a single pair of lungs. In the root of each neck there were exposed a thymus gland, trachea and œsophagus. The two œsophagi united to form a common one in the upper part of the thorax behind the heart.

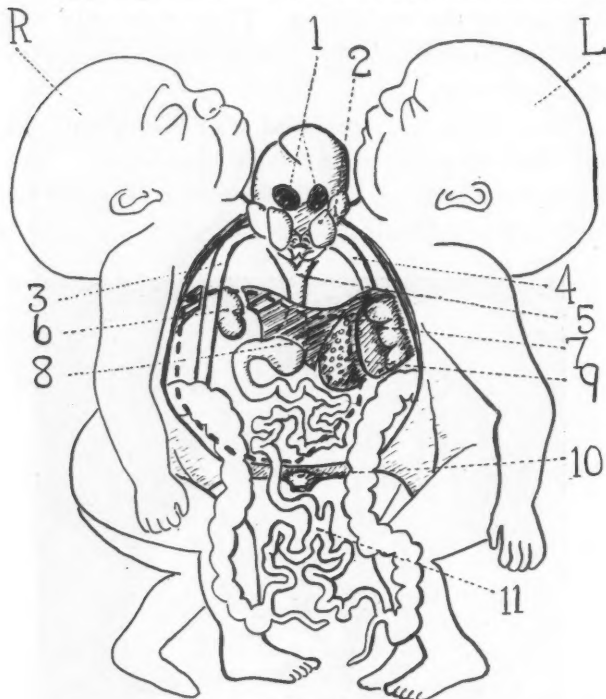


FIG. 2

Part of thoracic and abdominal wall removed to expose viscera. The larger (right) liver is indicated in broken outline.

(1) Single heart, upturned, showing openings of inferior venæ cavæ; (2) left lung; (3) right aorta; (4) left aorta; (5) common œsophagus; (6) right spleen; (7) left spleen; (8) single stomach fused with diaphragm; (9) smaller liver of left twin; (10) umbilicus; (11) small intestine bifurcating; Meckel's diverticulum present.

A large liver (marked in the diagram in broken outline) was found filling the abdominal cavity on that side of the specimen which was opened by dissection. On removal of this liver, the diaphragm was found to be incomplete, showing pleuro-pericardial sinuses, and in its central part was incorporated a single stomach. A pair of spleens were found, the larger lying anteriorly in the left twin. A small liver, without any apparent gall-bladder, was found lying posteriorly. The small intestine bifurcated at a point 18 cm. proximal to the ileocæcal junction, the terminal portions of the gut being double. At the point of bifurcation there was a short diverticulum (Meckel's). The genito-urinary system was normal for each individual.

Three cases of double monster complicating labour were reported in a former number of the *Journal*.¹ According to Schwalbe² thoracopagus is comparatively frequent, being the commonest form of double monster. Dorland³ states that Taruffi collected 119 cases, to which must be added 6 cases which Dorland himself has collected from the literature. A further case of thoracopagus complicating labour is reported by Hermann.⁴

Since the above was written, Mudaliar⁵ has published an article on this subject, profusely illustrated, showing varieties of double monster.

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2. SCHWALBE, *Morphologie der Missbildungen*, Jena, 1907, 12: 220.
3. DORLAND AND HUBBARD, *The X-Ray in Embryology and Obstetrics*, St. Paul, 1926.
4. HERMANN, *Wien. klin. Wchnschr.*, 1929, 42: 1016.
5. MUDALIAR, *J. Obst., Gyn. Brit. Emp.*, 1930, 37: 753.

A CASE OF ADDISON'S DISEASE WITH SUPRARENAL ATROPHY*

BY JOHN W. SCOTT, M.D., C.M.,

Edmonton

The patient, a male, 28 years of age, was admitted to the University Hospital on December 8, 1930, complaining of epigastric pain and loss of weight. His illness began eleven months before. The first symptom noted was a feeling of distress in the epigastrium, especially after meals. About the same time he noticed that he tired easily. He associated the onset of his symptoms with a severe shock which he sustained in January, 1930, from being trampled on by a horse. The symptoms gradually became worse, until in July he had severe pains in his epigastrium and back, with attacks of weakness, which necessitated his taking to bed for two or three days at a time. Between July and his admission to hospital in December he carried on his work as a farmer. During the interval, however, he was never free from dyspeptic symptoms and suffered a good deal from flatulence and constipation. On close questioning, he admitted that his skin was somewhat darker than a year before, but he had not particularly noticed it. In the eleven months prior to his

* From the Metabolism Department, University of Alberta Hospital, Edmonton.

admission to hospital his weight dropped from 145 to 123 lbs. There had been no loss of appetite, slight nausea occasionally, but no vomiting.

Personal and family history.—Irrelevant.

Physical examination.—When first seen, on December 8th, he was able to walk into hospital. Examination showed some evidence of loss of flesh. The skin was markedly dry, rough and inelastic. His face had the bluish-red colour that one associates with polycythæmia. There were patchy areas of light brown pigmentation on his neck and the upper part of his chest. The exposed part of the sclera showed a brownish discoloration. The skin of the nipples, axillæ and scrotum was only slightly darker than that of a normal person. There was no pigmentation in the mucous membrane of the mouth. Examination of the chest was negative. Examination of the cardio-vascular system showed a soft, easily compressible pulse, with a blood pressure of 105/80. The heart sounds were weak and distant. The temperature was subnormal for the

most part. No evidence of muscular weakness could be demonstrated by the ordinary test.

Examination of the blood, made at frequent intervals during his three weeks' stay in hospital, showed red blood cells 6,700,000 to 6,900,000 per c.mm., with a hæmoglobin percentage of 90 to 100. The cell volume was 54 per cent, after 30 minutes centrifuging. The white blood cells were 7,100 per c.mm., and the differential count showed polymorphonuclears 67 per cent; lymphocytes 26 per cent; transitionals 5 per cent; eosinophiles 2 per cent.

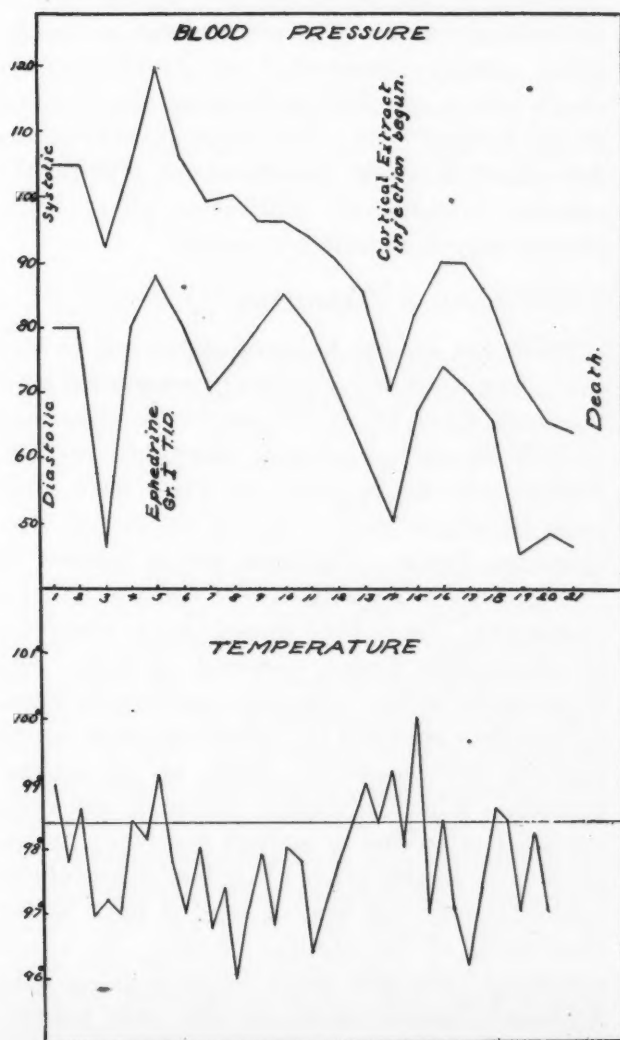
A provisional diagnosis of Addison's disease was made. The extreme dryness of the skin suggested hypothyroidism, but a basal metabolic rate determination, on December 10th, showed a rate within normal limits (−5). The marked loss of weight associated with dyspepsia suggested the possibility of malignant disease in the gastro-intestinal tract. A fractional gastric analysis showed a normal curve of free and total acidity, with no bile or blood. There was, however, a high residual secretion (120 c.c.). A barium series showed no abnormality except increased motility. The head of the barium meal had reached the rectum in five hours. However, the increased motility may have been due to the fact that the patient had been under treatment with ephedrine hydrochloride the previous day.

Biochemical investigation showed no abnormality in the urine on routine qualitative examination, except the presence of showers of granular casts on the day previous to his death. Creatinuria was present, as shown by a creatine output of 89 mg. in the 24-hour specimen, on December 13th.

Chemical examination of the blood, on December 18, showed non-protein nitrogen, 46 mg. (using the new method of Folin); chlorides 394 mg.; inorganic phosphorus 8 mg.; cholesterol 178 mg.; plasma albumin 3.83 per cent; globulin 2.97 per cent; fibrinogen 1.02 per cent, giving a total plasma protein of 7.82 per cent. The fasting blood sugar figures was 90 mg. and a glucose tolerance test, using 90 grams of glucose, showed an increase of glucose tolerance, with a maximum rise to 133 mg. one-half hour after ingestion of the glucose.

An electrocardiographic examination on December 10th showed only a low Q.R.S. potential.

During the three weeks in which the patient was under observation the disease progressed rapidly. His skin became much more deeply



pigmented until his back became almost black. Ephedrine hydrochloride was given by the mouth in one grain doses three times a day. During the first three days of treatment he felt much better. The weakness and gastro-intestinal symptoms disappeared and the blood pressure rose to 120-80. The beneficial effect was very transient, however, and increasing doses caused no further improvement.

Prof. G. Hunter, of the Department of Biochemistry, was kind enough to prepare an extract of fresh suprarenal cortex according to the method described by Swingle and Piffner.¹ Improvement in several cases of Addison's² disease has been reported with this preparation, as well as prolongation of life of completely adrenalectomized animals. The patient was given 90 c.c. of the cortical extract, representing 2,700 gm. of suprarenal cortex, during the last week of his illness. The substance was given either subcutaneously or intravenously, beginning with a 5 c.c. dose, until as much as 25 c.c. was given in a single dose. Apart from the mild shock-like reaction at the time of injection, a transient rise of blood pressure and some subjective improvement, there was no apparent effect. Daily blood pressure observations showed a persistent decrease. Severe epigastric pain, hiccough, and vomiting set in on December 26th; urinary suppression was manifest on December 28th. The patient became progressively weaker and complained of numbness in his feet which was gradually moving up his legs. Two hours before his death on December 29th he was unable to move even a finger. There was no clouding of consciousness until about an hour before respiration ceased.

AUTOPSY FINDINGS

The only abnormalities noted were in the lungs and suprarenal glands, details of which are given below.

Lungs.—Both lungs lay free in the pleural cavities, except for a few old adhesions at the apex of the left lung. The lungs were pink in colour, with occasional areas of anthracotic pigmentation. They were voluminous and crepitant throughout. There was a small puckered scar at the apex of the right lung, and a subpleural, calcified nodule, the size of a bean, in the lower lobe (Ghon's tubercle). Peribronchial lymph-nodes—negative.

Suprarenals.—Both these glands were very

markedly diminished in size, particularly the right, which weighed 0.45 gm. The left weighed 22.1 gm. Both were very dark in appearance and moderately firm in consistency.

Microscopic examination showed that the normal arrangement of three layers of cortex was lacking. There was a dense subcapsular fibrosis and numerous peripheral groups of lymphocytes. Cortical cells were present in abundance, but showed an almost uniform condition of partial disintegration, with varying phases of nuclear degeneration. Many of the nuclei were situated at the periphery of the cortical cells. Scattered throughout the gland were groups of cortical cells having an adenomatous arrangement; these were apparently attempts at regeneration. There were also well defined groups of lymphocytes and less marked diffuse infiltration by similar cells. In the smaller of the two suprarenals, there was but little chromaffin tissue present. The larger of the two showed the presence of apparently normal chromaffin medulla, with, however, a type of lymphocytic infiltration similar to that seen in the cortical tissue. The picture was one of so-called primary contracted or atrophic suprarenals with a superimposed diffuse degeneration of the cortical cells. The latter process of degeneration, however, dominates the picture, the atrophic lymphocytic infiltrative phase being present only to a moderate degree.

COMMENTS

There are several features of interest in this case. The onset of symptoms in association with traumatic shock which the patient describes may be more than a coincidence. Borrmann,³ in 1906, Fischer and Lescheziner,⁴ in 1915, have cited cases in which trauma was an important precipitating factor. The facts are of interest in the light of the experiments of Cannon and his co-workers. These have shown that the removal of chromaffin tissue (adrenal medulla and sympathetic trunk) leads to a condition in which the animals operated on cannot measure up to physical and emotional strain as do normal animals. While Addison's disease is generally conceded to be due to cortical deficiency, it has never been clearly proved that loss of medullary substance may not play a related part in the production of the clinical picture. Is it not significant then that many patients dying with Addison's disease show, as did this patient,

medullary as well as cortical atrophy or destruction, and date the onset of their symptoms from a severe shock?

A second point of interest is the presence of polycythæmia. This condition is no doubt due to blood concentration, and has been described in the terminal stages of Addison's disease and bilateral adrenalectomy in animals. Unfortunately the patient's condition did not permit a determination of the blood volume.

The chemical findings, *viz.*, creatinuria, increased non-protein nitrogen, diminution of chlorides, and increase of sugar tolerance are common findings in Addison's disease.

The failure of the patient to show definite improvement with cortical extract was disappointing. At the time of administration nothing was known of the non-toxicity of the extract or larger doses would have been given. It is now felt that the lack of improvement was due to insufficient dosage.

The absence of any evidence of tuberculous disease and the presence of fibrous atrophy occur in about 20 per cent of the cases of Addison's disease.

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4. FISCHER AND LESCHEZNER, *Dermat. Wochenschr.*, 1915, 61: 1115.

A CASE OF ADDISON'S DISEASE

By E. L. ROSS, M.D., AND
J. M. SIGVALDASON, B.Sc., M.D.,

*Manitoba Sanatorium,
Ninette, Man.*

A male, aged 34, was first admitted to Manitoba Sanatorium in April, 1924, with advanced bilateral pulmonary tuberculosis, more extensive in the left lung. A brother has since died of tuberculosis. He remained until April, 1927, with marked improvement in his symptoms. The lesions in both lungs cleared considerably, but a large cavity persisted in the left apex. By means of an apparatus with a thumb-screw a remarkable degree of compression of the upper chest wall was secured—a hollow showing in chest wall that would half bury a fist.

From discharge in April, 1927, until Novem-

ber, 1929, he carried on in good health at home, a mile from the Sanatorium, doing light work and still using the compression apparatus. Periodic examinations and plates showed nothing to indicate reactivation of his disease until November, 1929, when he complained of loss of appetite, a feeling of fullness after eating, nausea, vomiting and weakness, and it was noticed that his skin had an icteric tinge. The gastro-intestinal symptoms subsided in about four weeks, but weakness increased.

On January 10, 1930, he was readmitted, complaining of great weakness, the loss of 15 pounds in weight, also again of the feeling of fullness after meals, and some nausea and vomiting. Patchy pigmentation and bronzing was noticeable on the face, particularly on the forehead, on the neck and hands, and mucous membranes. There was no cough nor expectoration, and indeed nothing was found to suggest pulmonary reactivation. His blood pressure was 64/48; pulse soft and weak. Blood count:—red blood cells, 5,042,000; white blood cells, 12,250; hæmoglobin, 85 per cent; colour-index, 78. Albumin and casts were present in urine. A barium meal showed normal findings. The Wassermann test was negative.

A diagnosis was made of Addison's disease, and treatment with adrenal cortex started. Gastro-intestinal symptoms lessened somewhat, and the blood pressure was slightly increased. After two months of apparent improvement the general condition became worse, the asthenia was progressive, and toward the end prostration was complete. Depression and apathy were very marked, but finally there was irritability, excitement and delirium. Death occurred on April 27, 1930. The blood pressure, taken repeatedly, was never higher than 78/56, and this was just after starting adrenal cortex treatment.

Autopsy report.—The body was thin and emaciated; the face, particularly the forehead, pigmented; mucous membranes, a greyish colour, with scattered areas of pigmentation; compression of the upper left chest marked; the subcutaneous fat over the chest and abdomen was of a bright yellow colour.

An abnormal amount of fluid was present in the pericardial sac; the heart smaller than normal. There was no free fluid in the right pleural cavity and only a few adhesions, easily broken down. The right lung appeared to be

normal. In the left thorax were many dense pleural adhesions and partial collapse of the upper lobe of the lung, which was quite firm.

In the abdominal cavity there was no free fluid, and no adhesions. The liver was firm and smaller than normal; spleen slightly enlarged and firm; kidneys somewhat small, but on section seemed normal. Both adrenals were firm and on section the normal structures were found to be replaced by caseation. The alimentary canal seemed normal. There were several en-

larged lymph glands in the lesser omentum. A gland was removed for section.

Microscopic examinations were reported upon by Professor William Boyd, Winnipeg, as follows:—"The adrenals are completely destroyed by tuberculosis. Much of the material is caseous and there is deposition of lime salts. The lymph gland shows no tuberculosis. The lung shows an old, practically healed, tuberculous lesion. It is almost entirely fibrotic, with scattered collections of lymphocytes and plasma cells".

Editorial

THE RELATIONSHIP OF THE PNEUMONOKONIOSES TO TUBERCULOSIS

THE pneumonokonioses, or "dust-diseases" of the lungs have been known for many years. In fact, it is more than a century ago since George Pearson¹ demonstrated that the black pigment so common in the lungs of city dwellers is carbon. Since his time almost every sort of mineral matter has been found in the lung, notably, various kinds of stone, clay, cement, asbestos, iron, steel, lead, shell, and ultramarine blue, as well as other substances of an organic nature, paper, cotton, wool, flour and tobacco. And this, probably, does not exhaust the list. All of the substances mentioned are associated with certain industrial occupations and may be regarded as potential pathological agents. For long the pneumonokonioses were vested with merely academic interest, and lungs affected with anthracosis, for example, were demonstrated in colleges for the edification of the budding pathologist. Now this attitude is changed and certain of the pneumonokonioses admittedly constitute industrial hazards of the first importance. As a result of this altered viewpoint the condition has called forth intensive study.

The pathological lesion common to all forms of pneumonokoniosis is fibrosis, and the degree of this change in the lung is correlated for the most part with the amount and character of the foreign particles inhaled. Soot, which is practically pure carbon, is the least irritating of all the dusts, the

particles being light, amorphous and flaky, while various kinds of stone, the particles of which are hard, crystalline and angular, are the most irritating. Worst of all are the dusts that contain silica, the reason for which statement will be advanced later. Only in exceptional cases does the dust get past the lung, but, years ago, W. H. Welch recorded a case of cirrhosis of the liver due the presence of carbon, and quite recently a Japanese, T. Uchiyama², has described a case of silicosis of the lungs that came to autopsy, in which the coeliac lymph-nodes were enlarged and showed complete silicotic change, while isolated fibroid nodules of silicosis were found in the liver and spleen. Cases such as these suggest the possibility of the widespread dissemination of foreign particles by way of the circulation, whether by the blood or lymph stream. The significance of this observation, where one is dealing with an inhaled dust that contains a soluble moiety, need not be elaborated.

While there are exceptions, the general rule may be stated, and this is accepted by most authorities, that coal miners as a class are relatively unaffected by tuberculosis, while those working amid siliceous dust are highly susceptible to this disease. This is a curious fact, and the explanation is not easy. It is all the more curious because silica in considerable amounts has been found in the lungs of coal-miners. As long ago as 1869

1. PEARSON, *Phil. Trans. Roy. Soc.*, 1813, 103: 159.

2. UCHIYAMA, *Beitr. z. path. Anat. u. z. allg. Pathol.*, 1928, 80: 218.

E. H. Greenhow³ published a chemical analysis of a coal-miner's lung in which he demonstrated the presence of thirty per cent of silica in the ash after incineration. Tattersall also, in 1926, called attention to the occurrence of silicosis in a number of coal-miners in South Wales who had been exposed to silica dust while working with drills in "hard headings". These observations have been confirmed and amplified by Prof. S. Lyle Cummins and his associates⁴, who found in the lung ash percentages of silica of the same order as those found by J. McCrae⁵ in the lungs of Rand gold-miners. Professor Cummins concludes "that the anthracosis of coal-miners is a dual condition in which the retention of coal dust in the lungs is associated with, and, in all probability, due to, a state of diffuse or nodular lung fibrosis and lymph blockage indistinguishable from that found in the silicosis of gold-miners on the Rand and of those engaged in the 'refractories' industries in this and other countries."

In attempting to find an adequate explanation for the fact that silicosis favours the development of pulmonary tuberculosis, while anthracosis does not, one is struck with the multiplicity of the theories advanced and, moreover, the contradictory nature of some of them. It is evident that the experimental work done in this connection, while suggestive, is incomplete and also needs confirmation. Again, it is evident that much of the discussion is academic and fails to take into account that a number of factors are to be reckoned with, all of which are variable. The theories, in a word, are sometimes too iron-bound. We shall refer to only a few of the more important of them.

Arnold (1885) does not believe in a direct bactericidal action of the carbon on the tubercle bacillus, and thinks that "if there is any action, it is due to the fact that the deposits of dust prevent the spread of the poison." Goldman (1905) thinks that coal dust does exert an antiseptic action. Dr. J. S. Haldane⁶ supposes that there is some soluble constituent in the dust that stimulates the phagocytes to activity, so that they

destroy the bacilli. Wainwright and Nichols⁷ say, "Our opinion is that coal dust in the lungs does exert a protective influence against the tubercle bacilli, and that it is due to the stimulating effect of coal dust on connective-tissue growth."

Professor Cummins (*loc. cit.*) thinks that these several theories will not bear close investigation. He holds that the fibrosis produced by the silica tends to lock up the carbon in the pulmonary tissue, and that then the carbon adsorbs the active principle of tuberculin. That such adsorption is possible he has been able to demonstrate *in vitro*. Mavrogordato⁸ was unable to obtain experimental evidence indicating that coal dust in the lung exerts a protective influence against tuberculosis, but advances a mechanical theory that the simultaneous inhalation of coal dust and silica facilitates the extrusion of silica-laden cells from the lungs, although a lung previously invaded by coal dust has no special ability in this direction.

Now let us pass on to the other side of the question. Silicosis is characteristically a very chronic affection, and in itself does not tend to shorten life. Yet, how comes it that a large proportion of silicotics (some seventy-five per cent) succumb to tuberculosis?

It seems to be generally agreed that the detrimental action of silica on the tissues is chemical rather than mechanical. A number of experiments could be adduced to support this theory, but we shall cite only one. A. Policard, S. Doubrow and M. Bouchardat⁹ mixed a suspension of silica dust with living cultures of cells (derived from the chick) and found that certain concentrations inhibited growth, while higher ones produced degenerative changes in the cells, as evidenced by alteration in the staining reactions, that might even lead to death. They conclude from their experiments that silica dust slowly dissolves in the tissues and poisons the neighbouring cells. Still another suggestion is that silica, when in solution, destroys the action of complement.

Direct evidence is forthcoming that silica is competent to hasten a tuberculous process.

3. GREENHOW, *Trans. Path. Soc.*, 1869, 20: 41.

4. CUMMINS, *J. Path. and Bacter.*, 1927, 30: 615. See also CUMMINS and SLADDEN, *ibid.*, 1930, 33: 1035.

5. MCCRAE, *Rep. South African Inst. for Med. Res.*, Johannesburg, 1913.

6. HALDANE, *Brit. M. J.*, 1931, 1: 154.

7. WAINWRIGHT AND NICHOLS, *Amer. J. Med. Scien.*, 1905, 130: 403.

8. MAVROGORDATO, *Rep. South African Inst. for Med. Res.*, Johannesburg, 1922, p. 124.

9. POLICARD, DOUBROW AND BOUCHARLAT, *Comptes rend. Acad. d. Scien.*, 1929, 189: 583.

L. U. Gardner¹⁰, investigating this question, obtained some striking results. He infected animals with a mild grade of tuberculosis and then caused them to inhale a variety of dusts. Dusts which contained silica stimulated the sluggish lesions of tuberculosis to definite activity. Quartz did this in 73.6 per cent of the cases; carborundum, in 38.8; and granite in 26.3. Marble and soft coal (which contain no silica) produced no such effect.

Silicon apparently is a very stable inert substance, yet, when in the form of silica, its solution can be readily effected by the addition of an alkali. Inasmuch as the blood and tissue fluids of the body are alkaline one can understand how silica may be dissolved in the lung and exert a toxic action, albeit the full effects may be years-long in developing.

In attempting to analyze the relationship of pulmonary tuberculosis to the various dust-diseases we would suggest that certain factors are of pre-eminent importance: (1) the avenues by which foreign material—dust and bacilli—may reach the lung; (2) the character of the invading substances; and (3) the reaction produced in the pulmonary tissues.

Aufrecht, years ago, showed by means of an artificial bronchial tree, through which he could draw smoke, that small particles of foreign matter did not pass beyond the branches representing the bronchi of the second and third orders. He did not think, therefore, that tubercle bacilli could be directly inhaled into the remoter alveoli of the lung, except, possibly, under conditions of exaggerated inspiratory effort. This supports Baumgarten's view that infection of the lung with tubercle bacilli is not so much direct, by inhalation, as indirect, by way of the naso-pharynx and the cervical lymphatics, to the hilus of the lung. Now, we may assume, with much certainty, that coal-miners and all other miners acquire tubercle bacilli much as other people do, in small quantities, and on the surface, not in the mine. We can be equally sure that the miner, from the nature of his work, puts forth increased inspiratory effort. Hence, he will inhale directly a relatively large quantity of coal dust and mineral matter into the recesses of the lung. At the same time, some of the dust will take the other course indicated, that is along the lymphatics. The chances are

that the miner acquires his tuberculosis early in life, as most others do, and that in many cases the infection is latent. The spread of the tuberculous infection will be conditioned by the permeability of the lymphatics of the lung, and the speed of extension will depend also on this factor, but much more on the presence of substances that can stimulate the growth of the bacilli, either directly, or by removing the barriers to that growth, *viz.*, by destroying phagocytes and tissue cells. Fibrosis, which in a greater or lesser degree accompanies all forms of pneumokoniosis, will, if extensive, delay the extension of infection. Now, in the case of silica we have a substance that is soluble and toxic, one that can encourage the growth of the tubercle bacillus, however it may bring this about; on the other hand, carbon is insoluble, inert, and devoid of chemical action. When silica and carbon are combined, as they are in the coal-miner's lung, may it not be that the chief action is physical and mechanical? Particles of silica and carbon are together in the same phagocytic cell, the latter in greater abundance. The carbon adsorbs relatively a greater proportion of the cell sap, so that less is available to effect solution of the silica, which is thus proportionately non-toxic. Any tubercle bacilli present will, therefore, lack stimulation, and the chief effects (irritation and reactionary fibrosis) will be attributable to the presence of a foreign body. Again, in the case of anthracosis, fibrosis, while not excessive, is widespread throughout the lung, as is indicated by the black network that can be seen in the pleural membrane. There is evidently here a considerable mechanical obstruction. Under such conditions a tuberculous process will spread with some difficulty. In the case of silicosis fibrosis is not so generalized; it tends to form whorls or nodules, leaving comparatively unaffected pulmonary tissue between. Indeed, H. G. Chapman¹¹ notes that in some cases of silicosis the lungs show no accumulation of silica and no fibrosis even after as long a period as twenty years. This would seem to support the view that the action of silica is toxic (chemical), rather than mechanical, and that fibrosis is no essential feature of silicosis. We may, conclude, therefore, with

10. GARDNER, *Amer. Rev. of Tuber.*, 1929, 20: 833.

11. CHAPMAN, Third Ann. Rep. Workers' Compensation Comm. of New South Wales, Sydney, 1930, p. 57.

some certainty that silica, when in solution, promotes the activity of the tubercle bacillus directly and at the same time inhibits or destroys the defensive powers of the phagocytes and tissue cells of the lung, and,

furthermore, that there is not sufficient fibrosis in many cases to close the lymphatic channels, thus permitting rapid extension of the tuberculous process.

A. G. N.

RECENT RESEARCH ON THE ETIOLOGY OF PUERPERAL FEVER

TWO interesting papers have appeared recently on the etiology of puerperal fever, a problem which the profession in both Europe and America is anxiously striving to solve. In 1928 the Scottish Board of Health published a report entitled "Maternal Mortality in Aberdeen", with special reference to the incidence of puerperal sepsis. In that report the hæmolytic streptococcus was incriminated as one of the most important agents in its causation, and the chief mode of infection was thought to be by the conveyance of the contagion in the droplets or spray thrown into the air from the throats of carriers among the attendant physicians, nurses or students. The Department of Health for Scotland¹ now publishes a second report in which Dr. John Smith, one of the physicians associated with the preparation of the previous report, presents the facts obtained in the routine bacteriological investigation of all the cases of puerperal fever and septic abortion admitted over a period of eight years to the Aberdeen City Hospital for Infectious Diseases. In 196 cases examined, the *streptococcus hæmolyticus* was found to be the sole infecting agent in 120 cases, and present, but associated with other organisms, in a further 29 cases. In three cases the uterine swabs were sterile, and in the remaining 44, *B. coli*, *B. proteus*, staphylococci, gonococci, pneumococci, diphtheroids and *streptococcus viridans* were found in various combinations. Blood cultures from 177 cases showed the *streptococcus hæmolyticus* as the only offending organism in 40 cases, and present with other organisms in 6 more. Thus 76 per cent showed the hæmolytic streptococcus in the uterus; 22.9 showed it in the blood; and in patients with secondary suppurative processes it was present in 93.4 per cent. Similar results were found in the 24 cases of septic abortion. In 15 of the cases due to the *streptococcus hæmolyticus*,

13 of which were cases of puerperal fever and 2 were cases of abortion, it was found possible to trace the infection to the throat or nose of the doctor, student, or nurse in attendance. In only one case might the infection be regarded as autogenous, as this patient was suffering from a streptococcal infection of the hand. In 3 other cases, *B. coli* infection was the cause. In 1 of these the organism was found in the urine. The investigation therefore again points to a carrier of pathogenic organisms in the throat as a source of puerperal infection, the carrier being usually free from any gross sign.

Nixon and Wright, of University College Hospital, London, report² two cases in which a fatal septicæmia due to the pneumococcus (type 1) developed very rapidly. Their detailed reports show clearly that the primary infection was in the uterus and that the lung changes were only secondary. In the first case, as the infection originated in private practice, it was not found practicable to examine any of those who attended the case, but in the second case, examination of the throats of the eleven individuals who were in association with the case revealed that the physician, who had made two futile attempts at forceps delivery in the patient's home, harboured in his throat a pneumococcus organism of the same type as the patient. The physicians reporting these cases regarded it as highly probable that the infection was transmitted from the respiratory tract of the attendant to the patient. There was no direct connection between these two cases.

In an editorial in the *Lancet*³ reference is made to the fact that it is now some years since hæmolytic streptococci were definitely incriminated as one of the chief agents in the etiology of puerperal fever, although other bacteria are also occasionally found to be offenders. Subsequent work has only increased the force of the indictment of this organism, and although some investigators,

1. Causation and Source of Infection in Puerperal Fever, by J. Smith, M.D., D.Sc., M.R.C.P., D.P.H., H.M. Stationery Office, 1931.

2. NIXON AND WRIGHT, *The Lancet*, 1929, 1: 1242.

3. *The Lancet*, 1931, 1: 250.

headed by Mr. Victor Bonney, have maintained that infection is mainly endogenous, the majority consider it to be almost invariably exogenous. Since the work of the Dicks on scarlet fever a great deal of bacteriological research on hæmolytic streptococci has been initiated. It seems probable that these organisms are very prevalent and that in many individuals they are harboured for long periods of time in the nostrils, tonsils and naso-pharynx. This latest work of Dr. Smith suggests that, once again, it is not nature and the anatomy of the parts that are at fault but the interference of man. Great care should be taken to secure not only aseptic hands but aseptic teeth and throats on the part of every attendant at a case of maternity. Every possible septic focus in patient or attendant should be carefully

investigated. Hospital beds should be isolated. At their first adoption aseptic methods greatly reduced the amount of puerperal sepsis, but since this first reduction its incidence has remained at a level higher than necessary owing, probably, to the neglect of some precaution against some frequently present source of infection. The respiratory tract would appear to be such a source, and precautions against infections from this source should be invariably taken. A light effective mask over nose and throat is now employed in many maternity hospitals. Dr. Smith is confident that as soon as all extrinsic sources of infection are removed and a satisfactory surgical technique is evolved a large decline in the number of fever cases is sure to follow.

A. D. B.

THE CAMPAIGN AGAINST DIPHTHERIA

IT is just over two years since the city of New York began its campaign against diphtheria within its borders. What have been the results? Dr. E. F. Brown, the Director of the Diphtheria Prevention Commission, has attempted to answer this question in the January number of the *Milbank Quarterly Bulletin*. He reminds us that immunity to diphtheria is not attained until six months after the final injection of toxin-antitoxin, so that this length of time must be subtracted from the two-year period under consideration. More important, however, in the analysis of the results is the well recognized fact that diphtheria of severe type has always shown a tendency to recur in cycles. The records for New York City show that these cycles are about $6\frac{1}{2}$ years long. The highest point of the last cycle was reached in 1927, and 1930 therefore might be expected to show a low incidence, since it would be about the middle of the cycle; and the average number of cases to be expected at such a time could be estimated from the records of the last two complete cycles. According to these records the lowest number of death cases recorded annually in this period was 463 (in 1929) whereas the number recorded for 1930 was only a little over 187. From these figures alone, therefore, it seems justifiable to assume that the campaign is having a definite effect on the occurrence of diphtheria in New York City.

It is significant also that of the 187 victims in 1930 not one had been given the full toxin-antitoxin treatment, *i.e.*, three injections.

Dr. Brown then speaks of the methods by which the public was educated regarding the campaign. The chief problem before the Commission was to convince the parents of the value of the toxin-antitoxin treatment. Placards were placed in the street cars and subways; about 10,000 letters were sent out to individuals every month; with the co-operation of Cardinal Hayes a special pastoral letter issued by him was distributed into 400,000 Catholic homes; electric signs were used on a large scale; diphtheria literature was translated into the 10 chief foreign languages; "healthmobiles" (clinics on wheels) toured the most congested parts of the city, the parks and the beaches, and immunized over 17,000 children; the radio, the newspapers, the "talkies" were all pressed into the service, and advertising by poster was carried on in many of the stores.

One point which was emphasized throughout all this instruction was the continual insistence that the immunization should be done by private doctors. In every appeal, both written and spoken, the public was advised to go to the family doctors for the treatment. Further, the physicians of New York City were asked through their medical societies to fix a fee of \$6.00 for the three

injections, and to set aside certain days on which these could be given at that rate. More than 41 per cent of the total number of medical men approached agreed to cooperate in this way.

The experiment seems to be completely justified and should be an example for many other cities to follow. But like any other successful campaign it requires most patient and laborious preparation. H. E. M.

Editorial Comments

Tubercle Bacillus Bacteriæmia and Acute Rheumatic Fever

Our present attitude towards the presence of tubercle bacilli in the circulating blood is very well summed up by Baldwin, Petroff and Gardner in their book as follows: "Tubercle bacilli must be present in the blood with much greater frequency than the results of examination would indicate. Pathological studies compel the belief that during the course of pulmonary tuberculosis infection of the blood stream is of frequent occurrence." In other words, pathological evidence is sufficiently strong to offset the relatively low percentages of tubercle bacillus bacillæmia which have been reported by various observers (Reiche, 1.6 per cent; Clough, 6.7 per cent and 66.6 per cent in miliary tuberculosis; Petroff 2.3 per cent, etc.), and it is usually accepted that when the method is improved the percentage of cases will be materially increased. This has been borne out by a paper at the end of last year by Löwenstein¹ of Vienna, who has cultured tubercle bacilli from the circulating blood in 148 of 304 cases of tuberculosis of various organs (lungs, kidneys, bones, etc.). A surprising feature perhaps is that 3 of 4 cases of ocular tuberculosis examined showed a tubercle bacillus bacillæmia. Still more recently, from the same laboratory, Fisher² has reported 31 positives of 77 cases examined. One may therefore say that in a large percentage of cases of any form of active tuberculosis tubercle bacilli have been demonstrated in the blood stream, a direct corroboration of what had been strongly suspected and argued from pathological evidence. Had Löwenstein gone no further one would have felt satisfied at his findings. But the extraordinary thing about his work is that in his 21 controls which were cases of acute rheumatic fever he cultivated tubercle bacilli from the blood stream in 100 per cent. So far as we are aware, he has not reported on the type of tubercle bacillus isolated, nor has he definitely claimed that he has discovered the cause of acute rheumatic fever. Nevertheless one feverishly awaits corroboration of his work.

Can one by carefully examining the method

employed by Löwenstein find sufficient reason to expect a higher percentage of positive cultures of tubercle bacilli than those previously recorded? This is difficult to answer, yet his method includes two points that are different. The first is that he completely removes the hæmoglobin by laking the red blood cells first in 3 per cent acetic acid and then in two washings of distilled water. The other is the medium which consists of a solid egg and potato starch medium the basis of which is an asparagin, glycerine and salt synthetic mixture.

It is worthy of note that Löwenstein has collaborated with several clinicians in his later publications and they are apparently not opposed to the idea of rheumatic fever being associated with the tubercle bacillus. Certain it is also that the histological lesions of rheumatic fever are not incompatible with the idea of an acid-fast bacillus being an etiological factor, if one presupposes also an unusual response on the part of the host.

ARNOLD BRANCH

The Azygos Lobe of the Right Lung

The paper of Dr. E. H. Shannon, entitled "The Azygos Lobe of the Lung", which appears elsewhere in this issue, calls attention to a somewhat uncommon anomaly of development involving the upper lobe of the right lung, an anomaly which, having little if any pathological significance, yet is of some practical importance in connection with the interpretation of certain shadows found at times in skiagrams of the upper part of the chest.

The anomaly in question consists in the existence of an accessory fissure involving the apical portion of the upper lobe of the right lung. It does not occur in the left lung. This fissure may cleave the apex (bifid apex), a small tongue-shaped lappet being split off on the mediastinal aspect of the lobe, or may cut the outer surface of the lobe at a point two inches below the apex, the accessory lobe forming the greater part of the apex of the lung. These are the two extremes, and the fissure generally is somewhat intermediate in size, descending from the apex.

This accessory pulmonary lobe was observed by the anatomist Wrisberg¹ as far back as 1777,

1. Löwenstein, *Münch. med. Wchnschr.*, 1930, 39: 1662; *et alia, ibid.*, 1930, 36: 1522.

2. Fisher, *Zeit. f. Tuberk.*, 1930, 58: 5.

1. Wrisberg, *Anatomy. Gottingen*, 1777, 8: 14.

but its radiographic study did not begin until 1923.² The anomaly is uncommon, but not rare. The writer, when doing post-mortem work at the Royal Victoria Hospital, Montreal, some years ago, noted its occurrence 6 times in 1,500 autopsies. This proportion is considerably higher than is indicated by recent radiographic examinations. Mather,³ of the Royal Chest Hospital, Liverpool, reports 4 cases in 3,000 consecutive radiograms of the chest, and Sparks (quoted by Nelson and Simon⁴) 6 cases in 6,000 consecutive radiograms. From this it would appear that the incidence is about 1 in 1,000 persons. The anatomy of the condition is now well understood, and for the chief facts relating to it we are indebted to the recent article of Nelson and Simon, just referred to.

The vena azygos major pursues its usual course behind the œsophagus just to the right of the midline until it reaches the level of the sixth thoracic vertebra, when, instead of arching forwards over the root of the lung, it turns in a lateral direction, dipping into the upper lobe. Then, after passing forwards and inclining medially, it terminates in the superior vena cava. The result is that an accessory lobe is split off from the medial side of the right upper lobe of the lung by a septum composed of both parietal and visceral layers of the pleura, in the lower free margin of which runs the vena azygos. The depth of the fissure varies. In some of the cases described the vein rested on the eparterial bronchus, while in others as much as an inch of pulmonary tissue intervened between the bottom of the fissure and the bronchus.

There are two variable factors in the development of this peculiar anomaly—the growing pulmonary buds and the growing cardinal veins. The posterior cardinal vein arches forwards across the œlom to join the duct of Cuvier, and it brings with it a fold of primitive pleural membrane which divides the apex of the pleuro-œlomic space into a medial and a lateral compartment. The pulmonary bud grows upwards and outwards, passing usually laterally to the vein, and, with the descent of the heart, the vein is drawn downwards and inwards, thus obliterating the medial apex. If, however, there should occur a slight alteration in the position of either—a pulmonary bud not lateral enough, or a vein too lateral—the pleural fold would impinge against the lung to produce, by locally inhibiting growth, a medial process which would gradually expand upwards as an accessory lobe. This is the true “azygos lobe.” It may be distinguished from other lobes that are sometimes erroneously called azygos lobes by the fact that

the fissure is lined by both parietal and visceral pleura.

The anomaly is of interest mainly from the anatomical and developmental point of view. Only in one of the recorded cases (Muller) was a pathological condition produced by it. Here, in a boy who died of leukæmia, the bronchus leading to the accessory lobe was narrowed to a mere slit at its point of contact with the azygos vein. Distally, the bronchus involved was dilated into a series of sacculi filled with mucus. However, it is well for radiologists to be on the look out for it, as thus some erroneous diagnoses may be avoided.

A. G. N.

The Diagnosis, Treatment and Control of Gonorrhœa

The Massachusetts Department of Health, with the cooperation of forty practising physicians, has prepared an article entitled, “Minimum Standards for the Diagnosis, Treatment and Control of Gonorrhœa in the Male and Female”. The entire article consists of practical, concise rules for the treatment of this disease and occupies seven pages in the *New England Journal of Medicine* (1930, 204: 424).

For those who rely on laboratory reports in the diagnosis of this condition the following statement may be surprising, “One Massachusetts clinic with an experience of over 4,000 cases of gonorrhœa in the female, finds that even in the acute stage, the first smear is negative for the gonococcus in one-half the cases. . . the examination of smears has its chief value, if the gonococcus cannot be found, in indicating the degree of infection according to the number of leucocytes present.”

Listed among the seven most important tests for cure is, “Absence of pus microscopically, or at most only three to five leucocytes per high power field, in at least eight consecutive smears of the urethral and cervical discharges, taken one week apart.”

The Massachusetts Department of Health is to be congratulated on helpful contribution to this field. It is hoped that other departments of health will obtain permission to make reprints of this article for distribution to practitioners and to medical students.

LILLIAN A. CHASE

William Henry Welch at Eighty

The *Journal* has received a copy of “William Henry Welch at Eighty,” a memorial record of celebrations around the world in his honour, which is edited by Victor O. Freeburg and published for the Special Committee by the Milbank Memorial Fund of New York. This work forms a charming memento of a great occasion. The frontispiece is a drypoint portrait of Dr. Welch by Alfred Hutty, the first impression of which was presented to Dr. Welch himself and

2. Wessler and Jackes, *Clinical Roentgenology of Diseases of the Chest*, The Southworth Co., Troy, N.Y., 1923, p. 17.

3. Mather and Coope, *Brit. J. Radiol.*, 1928, 1: 481.

4. Nelson and Simon, *Brit. M. J.*, 1931, 1: 9.

some fifty copies sent to various institutions in different parts of the world. Other illustrations include: Greetings from various learned bodies, notably one in colour from the Peiping Union Medical College; President Hoover with Dr. Welch; and a representation of the house in Norfolk, Connecticut, where Dr. Welch was born.

We have here the addresses given at the birthday celebrations by notable personages in widely separated parts of the world. From these we learn all the salient facts about Dr. Welch, and from his replies we can learn something of the man, his greatness, and his modesty, and can readily understand the charm which the most outstanding figure in American Medicine has exerted, and still exerts, on all who have come in contact with him. As Mr. John A. Kingsbury, the Secretary of the Executive Committee, says in the Foreword: "While the book is primarily a record of a particular occasion, it contains materials that illustrate the whole career of Dr. Welch and reveal many of the reasons for the profound affection of those for whom and with whom he has worked."

No finer portrayal of the man could be conceived than that given in an appreciation by an anonymous hand which appears early in the book, an appreciation which we cannot refrain from quoting.

William Henry Welch

"To have stepped, in the prime of life, into a position of acknowledged intellectual leadership in the profession of his choice; to have occupied that position, albeit unconsciously, for those forty years which have seen the most rapid strides in medical progress of all time; to have had such influence in the furtherance of the medical sciences in this country as to turn the tide of students seeking opportunities for higher education from the Old World to the New; to have been as ready in countless unrecorded ways to share his time and thought with those who were inconspicuous as with those who sat in high places; to have been no less universally respected for his great learning than beloved for his personal charm and companionability; to have stood knee-deep in honours and to have remained seemingly unaware of them; to have rounded out with distinction two successive university positions and, with enthusiasm undimmed, to be now well launched on a third which he is no less certain to adorn— To have done so much, in so many ways, for so many years, and to have aroused no shadow of envy or enmity on the way, betokens not only unselfishness of purpose but that fineness of character which always has been and always will be an inspiration to mankind."

A. G. N.

In Honour of Professor Ewing

Another book recently received by the *Journal*, very different from that just noticed, yet having a generic relationship to it, in that it is also planned to honour a great pathologist, is "Cancer, comprising Contributions to the Study of Cancer, in Honour of James Ewing." This notable work, which is reviewed elsewhere in our pages, is a *Festschrift* dedicated to Professor Ewing on the attainment of his sixty-fourth birthday. In it are to be found articles by authorities of international repute covering the broad field of cancer in its many aspects, all of which are of a high order and worthy both of their writers and of the master whom they are designed to honour. As Prof. W. H. Welch puts it in his Appreciation, which appears at the beginning of the volume, "Carefully edited by Doctor Adair, it is a tribute by colleagues and workers in the special field of Cancer to Professor James Ewing, an eminent scholar, an eminent trainer of scholars, an international leader in pathology." As a *Festschrift* it is a model. The wide range of the topics dealt with the volume may be said to typify the diverse interests and the breadth of view of Professor Ewing himself in regard to malignant disease, and, indeed, in regard to pathology in general. Professor Ewing is the author of more than one hundred and fifty papers, monographs, and text-books, dealing with the most varied subjects, but his interest has been with pathology from the beginning. His "Clinical Pathology of the Blood" appeared in 1901 and went into a second edition in 1903. In 1902 he edited "A Text-book of Pathology and Pathological Anatomy" by Hans Schmaus, of Munich. But probably Professor Ewing became more generally known through his work entitled "Neoplastic Diseases," the third edition of which appeared in 1928, and is a recognized authority on the subject. The study of cancer is a problem, or, rather, a group of problems of growing importance in medicine and public health, and Dr. Ewing early recognized that these problems must be attacked from all sides, clinical, pathological, and experimental. Never unduly carried away by unscientific optimism, in his numerous writings on the subject of cancer he has always been an example of judicial fairness and healthy conservatism. In short, he has always been a safe guide. The *Journal* ventures to add its congratulations to the many that Dr. Ewing has already received and to express the hope that he will be spared yet many years of beneficent service in the cause of medical science.

A. G. N.

The St. John Ambulance Association

The 21st Annual Report of the St. John Ambulance Association (Canadian Branch) shows a very healthy and vigorous organization.

In every aspect of its work the Association records great expansion and activity, and when one learns what large numbers of men and women are receiving instruction in first aid and home nursing the reflection arises that a notable piece of education is being quietly and unobtrusively carried out. This is better realized from watching the examinations of the instructors. These men show a grasp of the elementary points of anatomy and physiology, together with a proficiency in teaching, which is very striking.

The most obvious value of the work of the Association lies in the saving of life and minimizing of injury, but the medical profession should also realize that through the teachings of the Ambulance the medical man receives most loyal support. One of the fundamental points of instruction is that as soon as the first aid measures have been applied, the patient shall be placed under the care of a doctor. This may seem an obvious enough thing, but in these days of unqualified practitioners of the healing art it is of some importance that there should be so continually impressed on the minds of the mass the instinct to turn to those whose training has been thorough and rational.

The Association seems to need no encouragement. In spite of the widespread depression in business, the year's work (1930) has been phenomenally large. This is accounted for largely by the fact that employers of industry find that one of their large items of cost is that of accidents, and that instruction in first aid is one of the best methods of reducing this item. H. E. M.

The Late Professor Fuchs

On November 22nd last there occurred the death of Professor Ernst Fuchs, the world's greatest ophthalmologist. He was in his 80th year and death followed an attack of angina pectoris. Fuchs was a pupil of Billroth the famous surgeon, and early turned his attention to the specialty of ophthalmology. He was first called to Liège in Belgium, where he took charge of the eye department and from there he wrote and published his famous treatise "The Etiology and Prevention of Blindness."

In 1885 he returned to Vienna to succeed Professor Jäger, and it was not long before his clinic became the Mecca for ophthalmologists which it has remained to the present day.

From the beginning Fuchs was a student of ophthalmic pathology, and remained so to the end of his life—a great student and teacher of this basic subject. This is well shown in his text-book, one of the best medical text-books ever written, which has had some dozen of German editions, numerous English ones, and has been translated into many other languages, including Japanese and Chinese. It has become the Bible of Ophthalmology and will probably

remain so for generations. Great as Fuchs was as a student, physician and teacher, it is as a most lovable man that he will be remembered by the thousands who have been privileged to enjoy his friendship. He was an excellent linguist, and consequently an ideal host at the gatherings in his Vienna home, which were international in character. At the International Congress in Amsterdam in September, 1929, over one hundred of the ophthalmologists there gathered at a luncheon to honour him. Many tributes of esteem and affection were offered at that time. His life has been a most distinguished one. He was the greatest ophthalmologist of our time. His knowledge, his modesty, his kindness made him so, and his greatest memorial will be the respect, admiration, and love of the thousands of patients and students who benefited so much from his amazing knowledge and kindness. S.H.M.

Maternal Welfare

In a communication from Prof. W. B. Hendry, Chairman of the Committee on Maternal Welfare of the Canadian Medical Association, the request is made that more attention in the discussions of the various provincial associations and county medical societies be given to toxæmias, infections and hæmorrhages connected with childbirth.

He writes as follows: "It would seem that if we could get the different provincial associations and county medical societies to embody these subjects in their yearly program as a routine we might be able to do something towards reducing our maternal mortality, which, while improving in some parts of the Dominion, is not so good in other parts."

This most important matter is earnestly commended to the attention of the various Provincial and Local Medical Societies, and to that of the medical press. The report of the Committee will appear in our next issue.

A.D.B.

The Royal College of Physicians and Surgeons of Canada

The Royal College of Physicians and Surgeons of Canada desires to announce that the first examinations will be held about the last week of September or the first week of October in Edmonton and Montreal.

The regulations relating to the examinations will be found in this issue under "General News", and copies of these may be obtained from the Registrar-Secretary, Royal College of Physicians and Surgeons of Canada, 184 College St., Toronto.

Further detailed announcements of the examinations will appear in subsequent issues of this *Journal*.

Clinical and Laboratory Notes

A METHOD OF DETERMINING GONOCOCCUS ANTIGEN IN THE URINE AND IN THE EXCRETIONS OF THE URINARY AND SEXUAL ORGANS

At the second Russian Urological Congress at Leningrad, 1927, Prof. Sophie Lissowskaja called attention to a new reaction for determining antigen in the urine of gonorrhoea patients. The urine is heated on a water bath to 60° for 30 minutes, and inactivated in this way. The antigonococcus serum is added to the urine and the reaction carried out according to the principle of Bordet and Gengou. Lissowskaja says that the reaction is valuable in the diagnosis of gonorrhoea, but sometimes the urine itself inhibits hæmolysis. In order to prevent this inhibition she proposes making the urine alkaline by adding 2 per cent soda solution.

The author tested the reaction both with urine and with the excretions of the genitourinary organs, and found it highly specific. This makes it valuable in the diagnosis of gonorrhoea, when clinical and bacteriological diagnosis is difficult. She found the excretions of gonorrhoea patients collected in physiological salt solution better as antigens than the urine. With these secretions there was no autoinhibition of hæmolysis, so that alkalization was not necessary. The reaction is the same with activated as with inactivated urine. She had the best results with a dose of 0.1 c.c., and not such good ones with a dose of 0.3. The addition of soda does not always overcome the antihæmolytic action of the urine. Urine that is alkaline to begin with has an unfavourable effect on the course of the reaction. Parallel experiments should be made with urine and the excretions in physiological salt solution. The reaction is recommended to serologists for further study and for improvement in some of the details of the technique.—Anna Schapiro. *Ztschr. f. Immunitätsforsch.*, 1930, 68: 1.

THE PITCH REACTION IN THE CEREBROSPINAL FLUID

The author has previously reported the first results of examination of the cerebrospinal fluid by a new technique, using pitch (*Picea canadensis*) as the antigen. In this first series of 84 cases the pitch reaction agreed in 91.6 per cent, with the Wassermann, benzoin, and Lange reactions. He has now tested the reaction in 210 cases. The reaction agreed absolutely with the Wassermann, benzoin, and Lange reactions in 182 fluids, or 86.6 per cent of the cases. It agreed with the Wassermann reaction alone in 92.8

per cent of the cases, or in 195 out of the 210. In 8 of the other 15 the Wassermann test was positive in the blood, but negative in the spinal fluid, and the benzoin and Lange reactions were negative. This gives an agreement of 96.6 per cent between the pitch reaction and the Wassermann reaction in the blood. In one case of hemiplegia and one of organic dementia the Wassermann, benzoin, and Lange reactions were all negative, while the pitch reaction was positive. It is quite probable that syphilis played some part in the etiology of these two diseases, as the patients were 45 and 54 years of age. Five of the cases in which there was disagreement in the reactions were treated cases of general paralysis, and it is impossible to say just what changes the treatment has produced in the reactions.

The pitch reaction can be carried out in a few minutes, and does not require any expensive apparatus. It is specific and more sensitive than benzoin and the colloidal gold reactions; it is not too sensitive to be reliable, if only clear fluids are used which do not contain either pus or blood.—Albert Bertrand. *L'Union méd. du Canada*. 1930, 59: 531.

SEROLOGICAL DIAGNOSIS OF SYPHILIS IN LEPERS

The value of the precipitation reaction of Kahn was studied in specimens of blood from 100 leprosy cases in comparison with the Wassermann test. There was absolute agreement in 90 per cent of cases. The test is fairly simple and brief. It compares more than favourably with the Wassermann reaction, as judged from a qualitative point of view. It is of special help in cases where rapid results are desired, but it needs a little practice to read the extent of precipitation correctly. Wassermann results are comparatively much more easy to read. With Kahn's reaction, however, in a certain number of cases it is extremely difficult to differentiate between the negative, doubtful, and a single plus reaction. The question arises whether leprosy *per se* gives a positive Wassermann reaction. The modern consensus (Lloyd, 1927) is that unless syphilitic infection is present in addition, a positive reaction is an exception rather than the rule.—M. L. Ahuja and S. M. K. Mallick. *Indian Jour. Med. Research*, 1930, 18: 707.

A NEW UROGRAPHIC MEDIUM

While intravenous or "excretion" urography is a valuable addition to the methods of genitourinary surgery, the older technique of retrograde pyelography nevertheless retains its place. How-

ever good the shadows derived from intravenous urography may be, they lack the clearness and density of those obtained by distension of the renal pelvis. For this reason work is still being done on the best media available for outlining the pelvis after ureteral catheterization, and Adolph A. Kutzmann reports good results with emulsified campidol, which is a mixture of

iodized rape-seed oil, acacia, and distilled water. He finds that an emulsion containing 10 per cent of iodine gives as good a shadow as that obtainable from the usual 12.5 per cent solution of sodium iodide, but whereas sodium iodide is irritating to the tissues and often produces a severe reaction and pain, the campidol emulsion is non-irritating.—*Amer. J. Surg.*, 1930, 10: 320.

Special Articles

FORTY YEARS OF PROGRESS IN PUBLIC HEALTH ADMINISTRATION IN THE WEST INDIES, AND TRINIDAD IN PARTICULAR

By S. M. LAURENCE, M.B., C.M. (Edin.),
M. O. H.

Port of Spain, Trinidad

Twenty years ago Sir R. Boyce found the administration of public health in the West Indies of sufficient interest and importance to induce him to write a book in which he described the advances which had taken place in these islands. My purpose is to compare the health history of the West Indies during the twenty years since Boyce wrote with the two previous decades, employing the earlier health history of the islands as a background, and so estimate the progress that has been made and the true position of the public health administration at the present time. Such an enquiry should not only be of interest because it concerns Britain's oldest colonial group, but also because of present-day relations between Canada and the British West Indies. More and more Canada is coming to look to the West Indies for health and business and pleasure, and so the health conditions obtaining in the islands must ever be of interest and consideration to the inhabitants of the great Dominion.

GENERAL CONDITIONS THAT FAVOUR EPIDEMIC DISEASES IN THE TROPICS

For the purposes of this paper British Guiana on the mainland of South America will be grouped with the islands, and the term West Indies will generally be limited to the British islands.

Climate.—The leading factor that favours epidemic diseases is the unbroken presence of heat and the occurrence of only two seasons. An almost uniform temperature throughout the year favours the free growth of both insect and vegetable life and as some of the most severe epidemic diseases are dependent for their spread on insect carriers the almost constant presence of a wealth of vectors is generally assured. Hence there is usually a ready supply of mosquitoes, flies, rats and fleas at hand to produce an epidemic, given the presence of a single case. But

unlike countries in temperate climes which have four seasons, tropical lands may be said to have only two, a wet and a dry. The wet season is ideal for the breeding of mosquitoes on account of the swamps it creates.

Race.—In the tropics the inhabitants, whether aboriginal or introduced, have not had the general educational advantages in matters of health and disease which would naturally filter down to all classes in the older communities of more temperate climes. In the West Indies, the aborigines, or Caribs, were a very primitive people, as were also the black slaves from Africa who were introduced to meet the demands of the labour market. When these last were freed, East Indians of the uneducated labouring class from India were introduced to supply labour needs, and to-day, in such a colony as Trinidad, they form one-third of the population. Lastly may be mentioned the European colonists who, coming fresh from a temperate clime, furnished an almost continuous supply of ready victims. This was especially the case when troops from Britain were stationed in most, if not all, of the islands. As these were frequently changed there was always fresh material for an epidemic.

As to how certain epidemic diseases made their appearance in the West Indies, it is a moot point whether they were introduced from other places or were native to the islands. Yellow fever, for instance, is thought by some to have been introduced by slaves brought from Africa, while others hold that travel was in the opposite direction, the disease being originally endemic here. In any event, whenever an epidemic broke out in the islands it was almost sure to spread to other lands owing to the large part trade with the West Indies played in the life of the time, and the absence of those precautionary measures which are so common and effective to-day.

THREE PERIODS OF HISTORY

To get a correct view of the progress in public health administration in these islands during the past forty years, it is necessary to begin by obtaining a glimpse of the health conditions obtaining just before that period, so as to be able to judge of the advances made. This progress has been gradual and may be best appreciated by considering the survey as covering three fairly distinct periods: an epidemic,

which preceded the year 1890; a transition, covered by the following twenty years; and a period of freedom, being the past twenty years during which these serious diseases have been brought under control by sound public health administration.

There can be no doubt as to the valid foundation on which the evil reputation of the West Indies rested previous to 1890. With equal certainty can the reputation for marked improvement in the next twenty years be stated to be beyond question, while the present standard of public health, as well as that of the methods of public health administration, offers indisputable proof of present-day advancement. It is quite easy in retrospect to determine the factors that produced the marked difference in the incidence of epidemics in these three periods. They may be simply stated as ignorance, the advent of knowledge without the means of applying it, and lastly, a progressive health administration in the ever growing light of that knowledge.

In view of the large number of victims from epidemic diseases before the last decade of the past century one cannot help reflecting how distressing must have been the lot of the medical men who realized their own ignorance and that of the alarmed inhabitants who saw disease roaming unchecked in their midst. The ignorance of the medical profession was only surpassed by the suffering and mortality among the populace. If the ignorance and superstition of the people laid the disease to the charge of evil spirits, they were only a little further from the truth than those members of our profession who attributed it to the noisome exhalations so common in these tropical lands. But even while ignorance of the cause of most of these diseases was laying a heavy toll on the inhabitants of these islands, the light of knowledge was breaking through the darkness, and what Jenner did for smallpox was soon to be done by the epoch-making work of Manson and Ross on the one hand, and Reid, Carrol, Guiteras and Agramonte on the other. If these western isles proved to be the cemetery of such numbers of European visitors and colonists in the days before these discoveries, they have to some extent atoned for the past by applying the knowledge obtained to such good use as gradually to reduce, and then to practically completely abolish, the incidence of those grave epidemic diseases for which they were notorious. The result is that twenty years ago the West Indies were beginning to apply the lessons of knowledge and so to render themselves safer alike for the European colonist and the native.

To be possessed of knowledge is one thing, to be able to apply it to the concerns of everyday life is another. And this lesson was being learnt at some cost, more particularly with regard to the mosquito-borne diseases of yellow fever and malaria. Mosquitoes had entrenched themselves everywhere, and, favoured by tropical rains with the consequent swamps and luxuriant foliage, were not to be dislodged for many a day. The

knowledge of the cause of many epidemic diseases had been wrung from nature at a great expense of time and talent, and, above all, of valuable lives, but we in these far-off isles of the west were as yet far from being able to apply it practically to the extent of abolishing these dangerous diseases. Three essential factors were wanting. In the first place we needed leaders. The new knowledge, would, it is true, spread to these lands by means of medical journals, but most of the senior medical men had been trained in the school which accepted bad air and foul emanations as the *causa causans* of most epidemics, and so were hardly fitted to become the enthusiastic leaders in the new ideas which were to revolutionize tropical diseases as well as the lands in which they held sway—gradually supplanting the evil notoriety of the West Indies, so fatal to the health and life of European colonists and visitors, by their present-day reputation as health and pleasure resorts second to none in the New World.

If medical men were slow to make effective practical use of the new weapons of attack research and experience had placed in their hands, even such attempts as were made were thwarted everywhere by the second factor of ignorance and superstition, which was not restricted to the poor and uneducated. The traditions of long years still held sway and the man in the street was not prepared to give up his cherished habits and ideas because of some new-fangled theories he could not understand. Nor was he alone in his inertia, for all, generally speaking, were as suspicious as they were ignorant. When there were unbelieving Thomases among those trained in the seats of learning, it is hardly surprising to find West Indians who had been accustomed to see myriads of larvæ in their water-barrels or ponds all their life lending only a deaf ear to the warnings of those who attributed such uncommon powers to such harmless little things.

To remove so great a mass of ignorance, if not opposition, time reinforced by education and the law alone sufficed. But there was yet another factor which was indispensable if the desired result was to be secured—men capable of going among the people and by firm yet kindly suasion instilling again and again the simple, yet all-important, truths on which the new methods were founded. In short, an army of sanitary inspectors became necessary to secure efficiency in health administration in this direction—the helpful agents of authority on the one hand, the sympathetic educators of the people, as well as the vigilant eye of the law, on the other. Such necessary agents did not spring up overnight in these islands. It is only by strong and sustained effort that even an island like Trinidad has come to secure the services of inspectors such as are second to none in the West Indies.

Before, however, pointing out the lines along which health administration has progressed, at any rate in the more important of these colonies,

it may be well to indicate the progressive advancement in public health during the three periods to which I have referred. This is best done by a brief reference to the individual diseases concerned. First, then, let us consider the diseases which are imported and dealt with by quarantine measures.

YELLOW FEVER

The most important disease in the history of these islands is yellow fever. Whatever its origin, it soon became endemic here, giving evidence of its abiding presence by more or less frequent epidemics in which the victims ranged from a few individuals to as many thousands. In the first half of the 19th century the number of yellow fever cases in some of the islands ranged from 5 to 87 per cent of the garrison stationed in them; and when to this is added the numbers of the natives attacked, it will readily be seen what a scourge it was at this period. My first recollection of the disease in my own island was in 1881, when the garrison was removed from its regular barracks to occupy a portion of the large building in which our college was housed!

By 1890 yellow fever had lost most of its hold on the West Indies, while by the end of the next twenty years it had almost completely died out, after a slight epidemic appearance in one or two of the islands between 1907 and 1909. By this time the knowledge gained by experiment in the larger islands and practice in the Canal Zone began to be applied in the islands, with the result that yellow fever has been practically banished from the West Indies during the past twenty years. It has been thought by some that a severe and fatal type of remittent fever which has been called "hæmorrhagic remittent" is really a type of yellow fever, bearing to it possibly a relation similar to that which alastrim bears to smallpox or paratyphoid to typhoid fever, and, it might be added, cholera to cholera.

SMALL-POX

It is a very long period since genuine virulent small-pox visited the West Indies in epidemic form. I have a very distinct recollection of the 1870-71 epidemic in my own island, for I happened to be attacked and escaped. Its great virulence, a wide incidence, and a heavy death toll characterized this outbreak. My next experience was a fairly widespread epidemic of the form now known as alastrim in many of these islands. This spread very readily, was marked by its mildness and the very slight pitting it left and the exceedingly slow death rate. Within the last twenty years, alastrim has appeared time and again in the West Indies and recently maintained itself in one of the larger islands for about three years. Closer attention to quarantine restrictions and up-to-date public health measures ought to suffice to hold small-pox at bay.

PLAGUE

Plague has never been a frequent or grave menace to the West Indies, with the exception probably of the two large formerly Spanish islands. In 1909 there was a fair outbreak in Trinidad. To the value of the up-to-date measures then employed I can testify, for I was made Medical Inspector of Port of Spain, a town of 60,000 inhabitants. Although the resources of the Public Health Department were far behind what they are to-day, the assistance rendered was invaluable. To illustrate. I was called about midday to see a young girl with high fever and a painful gland in the groin. She had been quite well and playing in the yard the previous afternoon. The Chief Sanitary Inspector was called in. Agreeing as to the highly suspicious character of the case, he punctured the gland, and in a short time the diagnosis was confirmed and further rigid steps taken. In spite of the crowded barrack yards which were numerous, the outbreak produced only 54 cases with 42 deaths. It is now eighteen years since the last case of plague occurred in the British West Indies.

CHOLERA

This grave and fatal disease has not visited the West Indies for over three-quarters of a century. The last epidemic was, I believe, in 1854. It reached Trinidad, where the outbreak was severe and the mortality heavy. Although constant communication has been maintained between India and some of the West Indies, cholera has never again been introduced.

With the introduction of a Quarantine Convention in the British West Indies, so much attention has been called to the diseases just considered that they are not easily introduced but very promptly dealt with. There are, however, certain other communicable diseases which are not only widespread and endemic, but, as also in more temperate climes, tax the efficiency and capacity of the public health service to the very maximum in its effort to diminish their incidence. Probably the only three worth mentioning in this connection are malaria, tuberculosis, and typhoid fever, and they are all three associated with water or damp.

MALARIA

For a long time a bane to the inhabitants of the West Indies, often contributing to a fatal issue where it did not primarily cause it, malaria has been gradually receding under the steady and intelligent application of those health measures made possible by the comparatively modern knowledge of its method of spread. I can still recall the discussions of medical men nearly half a century ago on the cause and spread of malaria, of which we had our full share in Trinidad. To-day, speaking for my own island, life, at any rate in the towns, is no longer lived under the far too exciting sting of innumerable mosquitoes on the one hand, and on the other the equally depressing chills of the trying malarial fever

resulting from it. The price of such a result has been eternal vigilance in the application of anti-mosquito measures with insistence and fearlessness until the new knowledge of cause and effect has entered into the very habits of both old and young. And as this enlightenment grows and spreads from the larger to the smaller islands, the time is drawing nigh when malaria, like yellow fever, will be like an ill-remembered nightmare.

TUBERCULOSIS

It must appear strange that tuberculosis should be as common as it is in the West Indies, seeing there is so much sunshine. This is accounted for by the excessive rainfall and consequent dampness, as well as by the large numbers of flies, both of which are essential factors in the spread of tuberculosis. Whatever may have been the incidence of this disease before 1890, I have actual experience of the improvement in dealing with it between that period and now. Overcrowding of healthy and affected persons, especially children, in the same room, and often the same bed; hermetically sealed rooms, excluding both sunshine and air; heat and dampness enervating the healthy, and forming a forcing-ground for germs, with neither knowledge of nor provision against their baneful effects. The ordinary West Indian home, especially among the poorer class, proved an efficient trap in which far too many of the innocent and unwary were caught. All this has, however, been changed. Knowledge, legislation, education in many and varied forms, as well as an anti-tuberculosis society have been the lever by which a population like that in Trinidad has been lifted to a much higher plane of immunity, leading to a drop in the mortality for this very fatal disease from 90.9 to 54.2. It is of interest to note that joint tuberculosis is exceedingly uncommon while the same may be said of tuberculosis among cattle. The best class of dairy cattle is imported from Canada. Of 1923 dairy cattle tested, 15 reacted positively, while 1904 were negative, and 4 doubtful.

TYPHOID FEVER

This disease has been prevalent, at any rate in Trinidad, for very many years, and I think the same may be said of the West Indies generally. Every now and again it breaks out in epidemic form and so engages the special attention of the health authority. The water in the City of Port of Spain fell under suspicion, and efforts were made to secure it against pollution, while systematic chlorinization was undertaken. At the same time urgent efforts have been directed to the reduction of the flies in the town—not so easy a matter in the tropics. These measures seem to have contributed to the reduction of typhoid incidence in Port of Spain, although it must be admitted that the fall was shared by smaller towns and country districts as well. The adverse influence of typhoid carriers remains to be estimated.

DYSENTERY

As one of the diseases which was of annual occurrence and claimed a heavy mortality dysentery may be mentioned. It is now a comparatively rare cause either of sickness or of death.

THE INFLUENCE OF QUARANTINE

Just over twenty-five years ago the British West Indies were isolated units as far as health measures were concerned, each island seeking to protect itself against its neighbour, often without any regard for recognized procedure. To abolish harsh treatment of neighbours and unify inter-colonial procedure, as well as to establish confidence between the islands and the utmost freedom of communication among the islanders, an intercolonial Quarantine Convention was drawn up, to which all British islands except Jamaica became signatories, as well as British Guiana. Every signatory being under obligation to report the occurrence of quarantinable disease to every other signatory, as well as to observe certain other requirements in public health administration, this signal advance in united action resulted in further improvement in individual health service. Meeting quinquennially, the delegates of the islands bring about such changes as are necessary to keep quarantine impositions abreast of the scientific knowledge and needs of the day. In this way the more advanced draw the less developed islands along the path of progress in many important matters of health. In the event of an outbreak of quarantinable disease in any island, not only is every other island notified at once but every passenger leaving the infected place for an island signatory to the Convention, has to be examined on the day of departure and certified as being free from the disease in question. This Convention is now framed on the International Paris Convention and the results have so far proved amply satisfactory.

PUBLIC HEALTH ADMINISTRATION IN TRINIDAD

Of the British West Indies Trinidad comes next to Jamaica in size, population, and prosperity as indicated by revenue. A brief description of the public health administration of Trinidad ought therefore to give some indication of the greatest advance made in health matters and the likely influence such an example is almost certain to have on her less progressive neighbours. It has been pointed out that the signing of a quarantine convention about a quarter of a century ago not only unified procedure in that particular sphere of preventive medicine but reacted on the health activities of the individual islands.

In 1915 Trinidad enacted a comprehensive and up-to-date Public Health Ordinance giving the widest powers to the public health authorities to employ all the measures necessary to raise the public health service of the island to the position demanded by the modern views on health administration, thus seeking to do for diseases within the colony, such as malaria, typhoid, etc., what

the Convention had done for quarantinable diseases. It was proclaimed in 1917. The central administration was first improved by appointing a properly qualified Medical Inspector of Health, and later on an assistant. Local health authorities were formed in the urban and rural districts and Medical Officers of Health appointed. Notification of certain diseases came into force and isolation hospitals were provided. A well-equipped bacteriological laboratory was erected and a bacteriologist employed. Not only was it possible to have a diagnosis made of tuberculosis, syphilis, venereal diseases, etc., but it also became possible to have vaccines made on the spot. Research work is also undertaken. In view of the heavy incidence of typhoid fever extensive protective inoculations were made all over the island. Anti-malarial measures, also, were pushed, thus ridding the more thickly populated places of this scourge. Rats and flies have been systematically destroyed. Stringent building regulations have been made to eliminate damp and secure sunlight and air, while shops,

bake houses, markets, abattoirs and all the elaborate machinery, human and otherwise, needed in the procuring and distribution of food has been brought under control. To meet the demands of the efficient public health service of this kind a small army of sanitary inspectors has been trained, not a few of whom hold very satisfactory certificates, such as those of the Royal Sanitary Institute of London.

Among all these manifold services the claims of the child have not been forgotten. An active Child Welfare League is endeavouring to spread a knowledge of the proper care of the infant and child up to the period of school age, when it is taken over by the school medical inspection service. While it cannot be expected that expert workers will be found for every branch of public health work, it must be admitted that the program is a fairly comprehensive one, which, even if only gradually carried out, should lead in time to a marked improvement in the general health of the colony.

Men and Books

HOFRAT PROFESSOR ERNST FUCHS

BY W. GORDON M. BYERS, M.D., D.Sc.,
Montreal

With sorrow and a keen sense of personal loss, ophthalmologists throughout the world learned of the death, in his eightieth year, of Hofrat Prof. Ernst Fuchs, at his home in Vienna, on November 21st, 1930. The end came suddenly during an attack of angina pectoris.

Professor Fuchs began his training in ophthalmology at Vienna in 1873, under the celebrated von Arlt; but at the end of a year, at his Chief's suggestion, he transferred to the clinic of Billroth, as von Arlt very wisely wished that his future assistants should also be educated as general surgeons. His period of service under Billroth occurred at a most fortunate epoch, for it was coincident with the introduction of antiseptics. Lister himself came for several weeks to Billroth's clinic and demonstrated his methods. When Professor Fuchs returned to Professor von Arlt, he was given a free hand to apply the new method in the ophthalmic service.

A chair of ophthalmology was founded at Liège in 1881, and Professor Fuchs was called to be its first occupant. Here, as is necessary in Belgium, he was able to conduct his teaching entirely in French. In this achievement one notes one of Fuchs's striking gifts, for he possessed a working knowledge of Spanish and other tongues, in addition to a perfect command of English and French.

During this period Fuchs published his notable essay on "The Causes and Prevention of Blind-

ness," for which he was awarded a special prize at the International Congress for Hygiene at The Hague in 1884. His interest in this field never flagged, and further recognition of his efforts on behalf of the blind came happily just before the close of his long career. At the International Ophthalmological Congress held in Holland, September 1929, he was presented at Amsterdam with the Leslie Dana gold medal, in recognition of outstanding achievement in the prevention of blindness and the conservation of vision, and a few days later he was elected First Honorary Member of the International Association for the Prevention of Blindness, when that association was formed at Scheveningen.

In 1885, Fuchs was appointed Professor of Ophthalmology and Director of the University eye clinic at Vienna. He enhanced the reputation of the Austrian capital as an ophthalmic centre by his clinical and pathological investigations and the excellence of his teaching. In the fields of clinical ophthalmology and the pathology of the eye, it is almost easier to say what subjects he did not write upon than what he did. Practically all his papers are contributions of the first order, general in character, and based upon prolonged study and investigation.

In Professor Fuchs's time, in consequence of the great growth in the number of students, group teaching was no longer possible, and the undergraduate clinics were of the amphitheatre type. Selected cases, assembled on the floor of the theatre, were first briefly described and explained by the Professor, and then turned over to assistants, who led them up the aisles of the theatre, and showed them to the students. The

method was not ideal in that it stimulated but little the students' powers of observation and reasoning. Moreover, as the cases were handed over to the demonstrators while the Professor was still speaking, there was a good deal of confusion. Professor Fuchs realized the weakness of this method, but felt that nothing else could be done. The intimate contacts of his early days were possible only with his comparatively few assistants, and it is by them, outstanding ophthalmologists in every quarter of the globe, that the great Vienna traditions will be passed on.

Professor Fuchs regarded the transcription of lectures as an antiquated practice. He felt that it distracted the attention of the scholar from what was going on in front of his eyes, and that the after decipherment and study of what had been written entailed a great waste of effort and of time. He decided early, therefore, to provide his students with a text book that would embody the substance of his lectures, and he conceived the excellent idea of having those sections of the book intended for undergraduate study printed in large type, and the remainder of the text, designed for purposes of reference in later life, printed in smaller characters.

Published first in 1889, his "Lehrbuch der Augenheilkunde" passed through twelve German editions, and was translated into all the important European languages, as well as Japanese and Chinese. Its style was remarkably clear and concise. Following the Vienna teaching, the greatest emphasis was laid upon the clinical picture, but the pathology of the eye received fuller treatment than in any previous text-book. The work was remarkable, too, for the wealth and excellence of its illustrations,—for its full appreciation of the pedagogic value of visual associations. Its influence upon subsequent ophthalmic authors has been great, and posterity will preserve it and Mackenzie's "Diseases of the Eye" (1st edition, 1833) as the outstanding ophthalmic text-books of the nineteenth century.

Up to the time of the war Professor Fuchs was wealthy. He was gregarious by nature, and hospitable. His ability to speak in several tongues, and his cosmopolitan outlook made him an ideal host. Hundreds of oculists in all parts of the world will recall with "pleasure that is almost pain" their pre-war days in Vienna, with Fuchs's clinic as the centre of their activities. With the war came dark years, courageously faced, and loss of fortune, but he was not embittered, and he accepted, in the spirit in which it was tendered, an invitation from former pupils to deliver a course of lectures on the pathology of the eye in several of the large centres of the United States.

Unlike most men, Professor Fuchs did not drop his work on retirement, but continued his studies, his writings, and his attendance at scientific meetings till the end. Though in his eightieth year, he again crossed the Atlantic last autumn to deliver an address at the opening of the new ophthalmic institute in Baltimore. He landed in Montreal, and spent a few days with us before proceeding south. We all came under the spell of his personality. He was a charming and courteous old gentleman, of fine appearance, with gray eyes as bright as a boy's, that mirrored a mind still active and inquiring. His deep interest extended beyond ophthalmology to every phase of life, and his mind was stored with memories of men great in his own field and great in the affairs of the world. But what struck one most was his wonderful modesty, and his broad and tolerant outlook on life. What he was to us, he was to thousands of others. Few men have been more widely known and more highly respected than Professor Fuchs, and beyond all question his place in the history of ophthalmology will be high and enduring.

Der edle Mensch
Sei hilfreich und gut;
Unermüdet schaff'er
Das Nützliche, Rechte;
Sei uns ein Vorbild
Jener geahneten Wesen.

THE RELATIONSHIP OF HERPES ZOSTER AND VARICELLA.—A. Netter and A. Ubain have for the last ten years been examining, by means of the employment fixation test, the serum of patients suffering from herpes zoster, using as an antigen the vesicular fluid, or, better still, a suspension of the vesicular crusts. In the first 100 cases examined the serum was found to contain antibodies in 93 per cent. Over 150 cases have now been examined, apparently with similar results. More than half of the cases have been of the secondary type, occurring in the course of various local and general diseases, and intoxications such as arsenical or bismuth poisoning. No fewer than 28 of the patients with secondary zona were tuberculous. From the serological point of view there seems to be no difference between the primary and the secondary type; both lead to the development of specific antibodies reacting with the same antigen. With regard to the relation between herpes zoster and

varicella, the authors have now collected over 230 observations on the development of one of these diseases after exposure to the other. The complement-fixation reaction has shown that the serum of patients with chicken-pox reacts to an antigen of zona crusts exactly as it does to an antigen of varicella crusts; conversely, the serum of a zona patient reacts equally well with an antigen of zona and of varicella crusts. This holds true not only for the serum of patients with primary herpes zoster, but also for those with zoster coming on after encephalitis, vaccination, arsenical poisoning, and so on. The authors therefore conclude that the virus of varicella and of zoster are antigenically alike. The varicella virus appears to be more infective, and to leave behind it more solid immunity than the zona virus; these differences, however, are no greater than those between variola virus and vaccinia virus, which are known to be antigenically the same.—*Ann. de l'Inst. Pasteur*, Jan., 1931, 46: 17.

Association Notes

THE VANCOUVER MEETING

[The following letter has been received from the Publicity Committee in regard to the coming meeting of the Canadian Medical Association at Vancouver. We commend it to the attention of our readers.—Ed.]

Dear Doctor:—

This is to remind you personally that the Canadian Medical Association meeting this year will be held in Vancouver in June.

If you have visited the Coast before, you will be glad to have such an excellent reason for coming again. If you have yet to make your first visit, then there could not be a better time or occasion for it. You have heard something perhaps of the wonders of British Columbia coast and mountain scenery. If we might plagiarize Byron, we could say that "The mountains look on Vancouver and Vancouver looks on the sea." Think what that means to the success and enjoyment of such a meeting; scientific sessions not made tedious and oppressive by reason of heat; recreations made more enjoyable under the influence of sea-tempered breezes.

Among those whose addresses will make the scientific sessions valuable will be many notable authorities from the United States and Canada.

In the matter of entertainment features, the ladies, who it is much hoped will be present in large numbers, will be especially catered for. Among other items, a dinner dance, garden parties, a steamship cruise, excursions to Grouse Mountain Chalet, overlooking the city from an eminence of thirty-eight hundred feet, and golf on sea-girt links are being arranged.

Visitors from eastern points are reminded that a round trip ticket to Victoria costs no more than one to Vancouver, and are recommended to book through to Victoria, availing themselves of the delightful voyage by sea and the beautiful old-world atmosphere of the Capital City.

Yours truly,

D. E. H. CLEVELAND, M.D.,

Chairman, Publicity Committee.

VANCOUVER'S NORTH SHORE

From the North Arm of Burrard Inlet on the east to the waters of Howe Sound on the west, there is an extraordinary profusion of streams, valleys, mountain peaks, quiet nooks, natural parks, lagoon-like waterways and yawning chasms that intermingle in bewildering and fascinating fashion.

There is probably no other area of equal extent that encompasses such an assortment of attractions for tourists of all kinds and of whatever inclination as this approximately twenty-mile stretch extending along the base of the hills that shelve back from Vancouver's harbour for hundreds of miles to the north. The motorist, the hiker, the mountaineer, the fisherman, the bather, the boatsman, the hunter or the golfer can here find his own favourite recreation in a setting that is unsurpassed, amid ideal climatic conditions.

The waters of the harbour and the Gulp lap the shores of tiny bays and land-locked lagoons, rich with luxuriant vegetation that reaches down to the very edge of lovely sandy beaches. The mountains that rise behind, with their snow-capped peaks, ranging in altitude from 3,000 to 6,000 feet, are pierced by beautiful mountain streams seeking their torrential way through canyon after canyon.

Vancouver's busy harbour, with the city rising up behind and stretching far to the south and east, offers a striking contrast to the primitive grandeur of the forest-clad hills to the north. Settlement fringes the base of the hills along this miniature Riviera. Cosy and attractive looking summer homes surmount the choicest locations looking out to sea. Inns and tea-rooms are found in unexpected places and located at convenient intervals—on the main highway that follows the diverse meanderings of the shoreline, on the many side-roads and trails that lead one into the charming reaches of the hills and valleys to the north.

Most famous of the many beauty spots in this region is Capilano Canyon with its swaying steel cable bridge 450 feet long and 210 feet above the tumultuous Capilano River. The thrill, the deeply-gored canyon, the vegetation, sunlight playing through leaf and fern over the foaming waters, are all beyond description. At a little distance up the river, the Second or Grand Canyon can be seen, also with a suspen-

sion bridge, more wild and rugged than the lower reaches. Pictographs on the smooth-worn face of the canyon walls, placed there numberless years ago and renewed in the last



Grand Canyon

few years by an Indian artist, set forth early Indian legends. Primitive nature in her wildest and most glorious state mingles with man-made gardens containing flowers and plants brought from mountainous districts all over the world.

Of lesser majesty, but with equal beauty and attraction, are Lynn and Seymour Canyons, two lovely gorges pierced by the Lynn and Seymour creeks as they rush on their turbulent way to join the waters of the Inlet at the eastern end of the harbour. These two streams, along with the Capilano, are famous not only for their



Grouse Mountain Chalet

beauty but for the excellent fishing afforded in their upper and lower reaches.

Another name that is associated with the name of Vancouver whenever the city is mentioned is Grouse Mountain. Perched high on a shoulder of the mountain, 4,000 feet above and overlooking the harbour and city, a chalet has been built, reached by a highway that is a supreme achievement in road engineering, affording many excellent views of the city and surrounding country as it winds its tortuous way up and around the face of the mountain-side. The visitor to Vancouver should not fail to make this trip, if only to get a birdseye view of the magnificent setting and location of the city. In the hinterland to the north of the Chalet is a wonderful region that is becoming yearly more famous as a winter-sports resort from November to May and a mountaineer's playground during the summer months. Mountain lakes with heather-carpeted meadows, multi-coloured Alpine flowers and numerous lovely upland paths make it a delightful recreation ground.



The Lions

The western section of this region is confined to summer homes that nestle on the shores of little bays, while, behind, Hollyburn Ridge rises almost from the water for over 3,000 feet,—the plateau that stretches to the north equalling in loveliness that of the Grouse Mountain plateau. Numerous streams indent the ridge at frequent intervals in their descent down the mountain-side, cascading over the ledges in a series of miniature waterfalls. One could spend day after day and week after week exploring the many side roads and trails, nooks and lagoons, and never tire or fail to feel the wonderful charm.

And over all the Lions raise their crowned heads, in all the varying moods of nature, unchanging; according to old Indian legend, sureties of the continuing peace and prosperity of the district over which they keep unending watch.

Hospital Service Department Notes

INTERNSHIP AND THE PHYSICIAN'S CAREER

The influence of an internship in a good hospital on the future of a young doctor is admirably depicted by Dr. Lewellys F. Barker in the leading article in a recent number of *The Modern Hospital*. He points out that the actual knowledge gained in caring for the patients is but a part of the benefits accruing from such appointments. "Among the most important influences during an intern's incumbency are those that emanate from his fellows upon the resident staff. The intramural life of a hospital is almost as sequestered as that of a monastery, and intimacies rapidly develop among the house officers who live in close quarters and eat at the same tables." Dr. Barker makes particular reference to the value of the informal discussions whereby medical knowledge and wisdom are imbibed with the coffee or the ginger ale, when the talk runs from allergic reactions to bacteriophages, from maggot treatment to vitamins, from dehydration diet in epilepsy to configuration psychology.

"A wide-awake intern living in such an environment cannot but grow medically through what he hears from his fellow interns. The growth will be most rapid in institutions of large size, with graded intern services and with a superstaff of assistant residents and residents. Hospitals that engage in teaching and research in addition to practice favour this reciprocal instruction of interns by one another. The presence of private patients in a hospital in addition to charity patients lends additional interest. There is a further advantage in institutions that draw their interns from more than one school, for though conferences of "likes" are agreeable, conferences of "unlikes" are often more instructive."

THE INFLUENCE OF THE ATTENDING STAFF

The time is long past, if indeed it ever existed, when the intern was supposed to be the mere poodle dog of an overbearing master who condescended to let him trot along during hospital rounds. The visiting surgeon or physician of to-day rightly looks upon his intern as a junior colleague who is extremely helpful to him in many ways. In return for this assistance, the visiting doctor feels himself in duty bound to do everything possible to promote the professional and social interests of the younger man, to show appreciation of his work, to instruct him by precept and by example, and to cultivate the intern's best qualities both of head and of heart. The influence of the visiting staff is enormous in the teaching of the ethical considerations of practice, of respect for the sacredness of confidential communications, of the discountenancing of any disparagement of a colleague's reputation, of the refusal to listen to malicious gossip, of the

abhorrence of charlatanism and of the protection of the patient's pocket—all of which are traits that will ever be remembered by younger men later on in their lives.

Interns quickly learn the fancies and foibles of their seniors. On the other hand, if the visiting staff fails to appreciate the value of a careful anamnesis, of a thorough and exact physical diagnosis, of laboratory and x-ray reports, of specialist reports, or of important progress notes, the effect upon the intern staff will soon be noticeable and will surely be deplorable. "No member of a visiting staff who is unable to teach, or who is unwilling to teach, or who cannot spend considerable time with the intern in study in common of a case, in discussion and in explanation, seems to me to have any right to a place in a modern hospital."

HOSPITAL DAY PREPARATIONS

It is anticipated that a still larger number than ever of our Canadian hospitals will participate this year in the Hospital Day movement. The mass impetus of a concerted program such as this has focussed a great deal of public attention on hospitals and their contribution to public welfare and the resultant publicity has proved of real value to the individual hospital.

As on previous occasions, May 12th, the birthday of Florence Nightingale, has been selected as Hospital Day for Canada and the United States. May 12th is being observed also this year as Red Cross Day in many countries. Special committees in the various provinces are now at work, completing the local arrangements. In many of the smaller cities, towns and villages especially, the Hospital Day celebration is a red letter day, second only to that of the graduation exercises. Many features likely to interest the public in their hospital are included in the program, such as "open house" for inspection of the various hospital facilities, laboratory and roentgenological demonstrations of interest to the public, a "home-coming" party for babies born in the hospital, a baby show, pulpit references, and a public meeting with addresses, hospital-movies, etc. One of the features of the 1931 convention of the American Hospital Association in Toronto, September 28th to October 2nd, will be the booth of the Hospital Day Committee in which will be displayed reports of programs, specimens of publicity, photographs, posters and other material used by hospitals on Hospital Day.

Owing to our geographic and climatic situation in Canada the question is frequently raised as to whether or not May 12th is the best date for Hospital Day. For the warmer parts of Canada it is an ideal date, but in other parts of this country in which the spring is retarded, the choice of this date does not permit any outdoor program, and, in fact, in some districts the roads have hardly been opened for ordinary

All communications intended for the Department of Hospital Service of the Canadian Medical Association should be addressed to Dr. Harvey Agnew, Secretary, 184 College Street, Toronto.

travel by this time. Certain hospital associations in the east and in the west, in supporting the movement, have suggested a later date for Canada. One date favoured is June 19th, which is now celebrated as Jeanne Mance Day in honour of the founder of the Hôtel Dieu in Montreal. However, British Columbia for a number of years has officially recognized the present Hospital Day in its convention and association activities. The Canadian Nurses Association, in its 1930 convention at Regina, by resolution favoured the retention of May 12th as Hospital Day, and the United Hospital Aids Association of Ontario is a group that has begun working towards a more elaborate program than ever on May 12th.

Whether or not climatic and other factors permit the choice of May 12th as the Hospital Day for any individual hospital, the fact remains that some day should be chosen for this occasion. The type of program to be arranged can be left to a local committee familiar with community conditions. We wish this Hospital Day movement every success.

A FATAL ANÆSTHETIC EXPLOSION

A very unusual accident occurred recently in an American hospital, when a patient to whom nitrous oxide, oxygen and ether were being administered as an anæsthetic was killed by an explosion of the gases occurring in the mouth and lungs. Details of the accident are given in the current issue of *Hospital Management*:

"The patient, a woman 43 years of age, was being operated on for gall-bladder trouble. The anæsthetist began with oxygen and nitrous oxide, but this did not seem to relax the patient sufficiently, and when the operation was about half completed the surgeon asked that some ether be added to the mixture. A short time after the ether was added there was a slight explosion about the face of the patient, producing a slight burn on the chin. The patient died immediately after. The explosion was sudden and slight, but evidently the intake into the lungs produced a combustion in the lungs, as the autopsy revealed that the lungs were badly torn. No one else in the operating room was in any way disturbed physically by the explosion and no damage was done to any of the equipment, with the exception of the rubber mask. The superintendent was called to the operating room immediately and considered the incident so grave and so rare that he called the coroner. An autopsy was held, and an inquest. The hospital, surgeon, and anæsthetist were all exonerated, for there is no possible way or means of accounting for the static that caused the explosion.

The superintendent immediately had a thorough examination made of all the equipment and found that everything was well grounded, including the operating table, gas machine and everything used in connection with the operation. A diathermy machine with a pad on each side of the patient was being used at the time of the operation for supportive measure. This machine was out in the hall and the door closed. The wires connecting the machine to the operating table were thoroughly insulated and were not considered in any way responsible for the static.

The superintendent has been complimented on and supported in the stand taken in reporting the tragedy so promptly, and for his endeavours to give any possible additional protection to operating rooms."

A HALIFAX SUPERINTENDENT PASSES

We are very sorry to note the sudden death of Mr. W. W. Kenney, who for thirty-three years was the Superintendent of the Victoria General Hospital at Halifax. He was an outstanding figure in hospital circles and had played an active part in the development of this fine teaching hospital to its present outstanding position. In paying public tribute to Mr. Kenney, Hon. Dr. George H. Murphy the Minister of Public Health said in part:

"He could have retired some years ago on superannuation, but his heart was in the hospital; its activity was part of his being, and often he told me that he could not contemplate life away from his hospital duties. And so he stayed on and worked and gave the institution he loved so well the benefit of a wide experience, a conscientious regard for duty, and a fine Christian charity which touched and softened much of the more rugged routine of his life. Mr. Kenney was the type that can never grow old. He lived in his work, letting time run its pace, while he measured his life with deeds."

Medical Societies

THE TORONTO ACADEMY OF MEDICINE

The Academy of Medicine, Toronto, has completed its second series of Wednesday afternoon lectures on subjects of special interest to the general practitioner. Each speaker was requested to present modern methods of diagnosis and treatment of the subject discussed, avoiding as much as possible purely speculative and theoretical aspects of the subject. The gratifying attendance of the Fellows has indicated the interest taken in such post-graduate lectures, and a third series is planned for next session.

The following lectures were given this year:—

Surgical Diagnosis and Differential Diagnosis of Acute Abdominal Conditions, Dr. R. V. B. Shier; Vitamins, Dr. Hardolph Wasteneys; Chronic Arthritis, Dr. A. A. Fletcher; Osteomyelitis, Dr. A. B. LeMesurier; General Principles in the Treatment of Fractures, Dr. G. E. Wilson; Bronchiectasis, its high Incidence in General Practice as revealed by the use of Lipiodol, Dr. A. H. W. Caulfeild; Infant Feeding, Dr. G. R. Pirie; Management of the Infirmities of Old Age, Dr. William Goldie; Renal Pain, Diagnosis and Treatment, Dr. Robin Pearse; Diseases of the Teeth and Jaws, Dr. E. F. Risdon; Deafness—Prevention, Differential Diagnosis and Cure, Dr. R. S. Pentecost; Psychiatric Conditions in General Practice, Dr. C. B. Farrar; Radium—Proven Uses and Limitations in Therapy, Dr. G. E. Richards; The Problem of the Nervous Child, Dr. W. E. Blatz.

The subject of health insurance as applied to the small wage earner is one in which increasing interest is being taken by both the medical profession and the laity. A special meeting of the Academy of Medicine, Toronto, was held on January 29, 1931, at which various aspects of this subject were presented.

A brief outline of the history of the movement from its beginning in the mediæval guilds up to the present day was given by Dr. Gordon Bates. He mentioned the present tendency to turn to established public health services for aid in this direction, and gave as his opinion that the problem was too extensive to be adequately handled in this way.

The viewpoint of the manufacturer was presented by Mr. H. W. Macdonnell, Secretary of the Industrial Relations Committee of the Canadian Manufacturers' Association. Mr. Macdonnell stated that the manufacturers were much interested and sympathetic towards the establishment of a scheme of health insurance, both from the humanitarian and self-interest standpoints. He said that, in general, manufacturers favoured compulsory rather than voluntary health insurance, and, also, a contribution in part by the beneficiaries.

The attitude of Labour was presented by Mr. James Simpson, Vice-President of the Dominion Trades and Labour Council. Mr. Simpson felt that the benefits of the Workmen's Compensation Boards, while excellent, were not comprehensive enough. He pointed out that, although the financial loss by strikes was considerable, the loss due to sickness was much more excessive. He stated that Labour favoured contribution in part by the beneficiaries, and he believed that an adequate scheme would reduce to a considerable extent the present enormous cost of free hospital treatment which at present was being borne by the municipalities.

The question of health insurance from the standpoint of the medical profession was discussed by Dr. Harris McPhedran, who expressed the view that both the laity and the profession would welcome the introduction of some form of health insurance as an alternative to the present high cost of medical care. He stated that the general practitioner at present was handicapped in earning his livelihood by the demand (often unjustifiable) for specialist treatment, which left the patient unable to meet the account of the family practitioner. He pointed out that the burden of caring for the indigent sick, which the physician assumes, means a heavy economic loss to him.

Dr. McPhedran reviewed at some length the different schemes of health insurance at present in force in various countries throughout the world, and expressed the view that some form of compulsory health insurance would be adopted in Canada in the near future. He stated that while the profession of Great Britain was at first bitterly opposed to the National Health Insurance Act of Great Britain, the panel system was now accepted and in the main approved. He drew attention to the economic position of the physician in Germany, Spain, Russia and other countries. Assuming that some scheme would be adopted in Canada, he outlined a com-

prehensive plan which he thought would be acceptable to both the profession and the laity.

The evening of March 3rd, was "Canadian Medical Night" at the Academy of Medicine, Toronto. A dinner was held at which the members of the Executive of the Canadian Medical Association and also of the Royal College of Physicians and Surgeons of Canada were guests of the Academy. Following the dinner, two very interesting addresses were given, one entitled "The operative treatment of fractures," by A. R. Munroe, Professor of Surgery, University of Alberta, and the other "Scolioptaxis," by E. L. Pope, Professor of Medicine, University of Alberta.

The following out-of-town guests were present: Drs. A. T. Bazin, W. T. Connell, T. Glen Hamilton, J. S. McEachern, J. C. Meakins, F. S. Patch, C. J. Veniot, Ward Woolner, L. J. Austin.

The Academy of Medicine, Toronto, was favoured on Wednesday, March 4th, with an address of peculiar interest by Dr. T. Glen Hamilton, of Winnipeg. Dr. Hamilton discussed clairvoyance, clairaudience and other psychic phenomena from the viewpoint of the scientist, and showed a remarkable series of slides made from controlled photographs depicting telekinesis, ectoplasm production, and other manifestations apparently conflicting with natural laws.

A combined meeting of the Sections of Medicine and Surgery of the Academy of Medicine, Toronto, was held on Tuesday, March 10th. A symposium was held on

- A. Practical Observations on Interference with the Autonomic Nervous System by Blocking or Extirpation:
 - (a) In Megacolon and Raynaud's Disease by Extirpation of Sympathetic Ganglia, D. E. Robertson.
 - (b) In Thromboarteritis Obliterans and other Vascular Diseases of the Extremities, Gordon Dale.
 - (c) In Diseases of the Genito-Urinary Tract, J. C. McClelland.
 - (d) In Cardiac Diseases, Leonard Murray.
 - (e) In Pulmonary Diseases, A. H. W. Caulfeild.
- B. Comments from the Physiological Point of View, C. H. Best.

Dr. Robertson presented case reports of six cases of megacolon occurring in children upon whom he had operated in the past few years. He pointed out that obstinate constipation was a characteristic of these cases. These children would not have a movement for a period of from twelve to fourteen days in spite of repeated enemas and the use of various drugs. Following interference with the autonomic nervous system, the children, under supervision, had natural

movements daily and the size of the colon decreased progressively and rapidly. Dr. Robertson also showed a case of Raynaud's disease in a young woman which was cured by the same means.

Dr. Gordon Dale, in discussing thrombo-arteritis obliterans, gave as his opinion that the condition was due to an infective process beginning at the distal end of the arteries. He presented seven cases in which ramisection or removal of the stellate ganglion was carried out with considerable relief. He did not claim that such a procedure would cure the condition, but it tended to relieve the pain and the feeling of cold in the extremities.

Referring to diseases of the genito-urinary tract, Dr. J. C. McClelland particularly mentioned the type of cases characterized by periodic severe pain in the kidney region without clinical signs, and with normal urinary findings. He stated that section of the sympathetic nerves to the kidney was followed by relief, and referred to the work of Professor Papin and the Doctors Harris of Australia.

Dr. Murray believed that in selected cases of angina pectoris, operation was indicated for the relief of pain.

Dr. Caulfeild briefly sketched the treatment used in asthmatics and cases of anaphylaxis, and pointed out that, while the results of operation were not convincing, there was a great field for future investigation.

Dr. Best briefly outlined the physiology of the autonomic nervous system, and referred to the research work of Claude Bernard and others resulting in the knowledge that in all mammalia two mechanisms, the nervous and chemical, were present, the latter being more fundamental.

THE CALGARY MEDICAL SOCIETY

On March 3rd Dr. E. P. Scarlett gave an interesting and lucid address to the members of the Calgary Medical Society, on "Some clinical aspects of heart block". This was illustrated by a number of case reports and electro-cardiographic charts were shown. He outlined the various types of heart block, graphically demonstrating the anatomical areas involved with the bundle of His as the centre, from which the disturbance arises. He classified heart block under: (1) delayed conduction due to (a) acute rheumatic fever, (b) acute respiratory infections, (c) coronary sclerosis; (2) partial heart block due to (a) two to one factor, (b) dropped beat; (3) complete heart block due to (a) acute infections, (b) acute coronary occlusion.

THE LINCOLN COUNTY MEDICAL ASSOCIATION

A meeting of the Lincoln County Medical Association was held at the St. Catharines General Hospital on Thursday, February 19th. The speaker of the evening was Dr. A. H. Gordon of McGill University, his subject being "The treatment of pneumonia". He dealt with the subject very thoroughly and pointed out the value of serum treatment in all but type three cases. Two case reports were pre-presented at the meeting, and Dr. Gordon entered into the discussion fully and made examination of the patients, all of which proved very interesting. One case was a rather typical lymphatic leukæmia. The other was a case of brain injury following an automobile accident. The total attendance at this meeting was 46. There are 30 active members in the Lincoln County Association.

THE NIAGARA DISTRICT MEDICAL ASSOCIATION

The members of the Niagara District Medical Association were present in large numbers at the regular meeting held in the General Brock Hotel, Niagara Falls, on Monday evening, February 2, 1931. The speaker of the evening was Dr. Frederick Etherington, Dean of the Medical Faculty of Queen's University, who gave one of the most interesting addresses listened to in a long time by the Association. His subject was, "Landmarks in the history of medicine." At the conclusion of the meeting, a supper was served which was enjoyed by all.

J. H. ELLIOTT

THE WESTERN ONTARIO ACADEMY OF MEDICINE

A meeting of the Western Ontario Academy of Medicine, which was held on January 30, 1931, at the Ontario Hospital, London, was addressed by Hon. Dr. John M. Robb, Minister of Health for Ontario, and Dr. B. T. McGhie, Director of Hospitals for the province.

Dr. Robb opened a discussion on the "Cancer situation", and presented statistics showing the increasing prevalence of cancer as a cause of death and suffering, expressing the view that the time had arrived when some steps should be taken within the Province of Ontario to curb this menace. He sought information and ideas for coping with the problem. Whatever the solution may be, its success depends upon the education of the public and the cooperation of the medical profession. This will lead to the only rational procedure, namely early diagnosis and early and efficient treatment. More

radium is needed in Ontario to meet the present requirements.

Dr. McGhie in his address outlined the mental health program which is being put into operation in the province. He explained that an attempt is being made through the agency of mental health clinics to discern mental illness in its incipency, to correct behaviour disorders, and consequently to limit the admissions to institutions for mentally-ill patients. Motion pictures were shown of activities which are being carried on at the Ontario Hospital at Orillia.

After the meeting, refreshments were served, thanks to the courtesy of Dr. F. S. Vrooman, Superintendent of the Ontario Hospital, London.

REGINA AND DISTRICT MEDICAL SOCIETY

Dr. W. A. Dakin addressed the Regina and District Medical Society in March on the "Pathogenesis and surgical treatment of genital tuberculosis." He fully discussed the two schools of thought, those who consider that the infection is primary in the epididymis, and those who think that the primary lesion is in the prostate and vesicles.

Dr. R. Ferguson, of Fort Qu'Appelle, spoke on the "Non-surgical treatment of genito-urinary tuberculosis." He said that from 1922 to 1928 there were 2,829 deaths in Saskatchewan from tuberculosis, but only 1.46 per cent were due to tuberculosis of the kidney. In the history of the province there have been only 11 cases recorded of tuberculosis of the female genital tract. There have been 107 cases in the province of tuberculosis of the kidney; in children under 14, only 3 cases. When it does occur in children it is more frequently bilateral. He considers that in renal tuberculosis there is no need for haste to operate; that frequently, under medical treatment alone, bacilli disappear from the urine and the symptoms clear up.

Dr. R. McAllister discussed "Tuberculosis of the female genital tract, and Dr. R. Riley gave a talk on laboratory methods for the isolation and culture of the tubercle bacillus.

The medical health officer, Dr. Coles, was present and answered the questions which had been brought up at a former meeting. He explained that he did not treat members of the city police force or firemen.

The Workmen's Compensation Act was discussed. One member stated that he saw a workman at his office, and prescribed a medicine. The Board allowed him \$2 for the office visit, but the druggist rendered an account to the doctor for \$1.75 for the medicine which he had prescribed, as the Board does not pay for medicine.

The library committee reported that space could be had in the public library and that the library staff would look after the matter of sending the books to doctors in the outside districts who wished the use of them.

The meeting observed a moment's silence in memory of the late Dr. T. A. Morrison who was present at the February meeting.

LILLIAN A. CHASE

University Notes

Dalhousie University

Many medical graduates of Dalhousie, scattered throughout the Dominion, have sat at the feet of Dr. Archibald MacMechan who has occupied the chair of English at Dalhousie for more than forty years. All such will join in the regret so generally felt that he is to retire from teaching at the end of the present session. No one could be associated with an institution for so long a time without becoming a part of it, and Dr. MacMechan has become a very real part of Dalhousie. Highly gifted as a lecturer and writer, he is especially gifted as a teacher and even more gifted as a captor of the hearts of students. The present session has brought much perturbation to Dalhousie. At its commencement, the University was called upon to mourn the death of Dr. Howard Murray, who had served many years as professor of classics and was greatly revered by all his associates. Later came the announcement, to which reference was made in a previous issue of the *Journal*, that President Mackenzie is soon to retire. And now it is learned that Dr. MacMechan is also to relinquish the teaching to which he has so conspicuously and so acceptably devoted himself. All who know him will wish him all possible enjoyment of a long life, which cannot be else than filled with much useful activity.

University of Glasgow

The curators, at their meeting on January 7th, appointed John Shaw Dunn, M.A., M.D., to the St. Mungo (Notman) Chair of Pathology in the University of Glasgow, in succession to the late Professor John Hammond Teacher. The holder of this chair is *ex officio* pathologist to the Royal Infirmary, where he has, in the Pathological Institute, accommodation and facilities for teaching and research. Professor Shaw Dunn is 47 years of age, and was educated in Glasgow. After graduating M.A. in 1901, and M.B. with honours in 1905, he took the degree of M.D. with honours in 1912, gaining a Bellahouston gold medal for excellence in this thesis. He then held resident posts in the Royal and Western Infirmaries and in the Royal Hospital for Sick Children. Thereafter he became assistant in the pathological department of the Western

Infirmery under Professor Muir, holding appointments in turn as lecturer in pathological histology and in clinical pathology in the university and director of the clinical laboratory in the Western Infirmery. During the war he was attached to the R.A.M.C., from which he retired with the brevet rank of major, and published important papers on war nephritis and gas gangrene. In 1919 he was appointed Professor of Pathology in the University of Birmingham, and in 1922 became Proctor Professor of Pathology in the University of Manchester. He has made numerous contributions to pathological literature in addition to those already mentioned.

University of London

The University Court, at its meeting on January 14th, accepted on behalf of the University the generous bequest of £4,000, free of legacy duty, from the late Miss Mary Ethel Sim Scharlieb, who died in 1926. The purpose of the bequest is the founding of a scholarship in memory of Miss Scharlieb's mother, the late Dame Mary Ann Dacomb Scharlieb, M.D., M.S., LL.D., to whose life interest the legacy was subject. The scholarship is to be called "The Mary Scharlieb Research Scholarship", and the conditions of award are to be determined by the University.

McGill University

The Pathological Department of McGill University announces that it will again conduct a summer course in Medical Museum Technique in which the various methods approved in Pathological and Medical Museums will be demonstrated. The course occupies two weeks and will consist of ten lectures of one hour each, and twenty practical laboratory sessions of two hours each. In addition students will be given the option of spending an additional week in the laboratory in acquainting themselves with any special technique they may desire. The various hospitals and museums in the City of Montreal will be visited. The instruction will be given by members of the staff of the Pathological Institute. The number of the students will be limited to eight. The course will begin on June 8th. Those desirous of attending should make application early to the Bursar of the University.

University of Toronto

The senate of the University of Toronto authorized the establishment of the Hastings Memorial Fellowship to commemorate the life and work of the late Dr. C. J. O. Hastings.

The Fellowship, endowed by funds raised by public subscriptions, organized by the Canadian Social Hygiene council, will be awarded every three years. The first award will be made in October, 1932, with a value of \$1,500.

The Fellow will engage in original investigations

in the field of preventive medicine under the direction of the head of the department of hygiene and preventive medicine.

Dr. F. C. Harrison, of Toronto, has been elected to the Senate of the University, to represent the graduates in Medicine.

Special Correspondence

The Edinburgh Letter

(From our own correspondent)

Prof. Arthur Robinson has intimated his intention of retiring from the Chair of Anatomy of Edinburgh University at the close of the academic year. The record of the Chair of Anatomy is an epitome of the history of the Medical Faculty. It was the first Chair to be definitely established in the University, and the teaching of the subject has been considered one of the main essentials of the curriculum. The story of the teaching of anatomy in Edinburgh goes back to the dawn of the Medical School. From its erection, the Incorporation of Barber-Surgeons adopted the fundamental principle "that every man ought to know the nature and substance of everything that he works, or else he be negligent". On this great truth, that a sound knowledge of anatomy was a fundamental necessity, was founded the success of the surgical school of Edinburgh. Although the barber-surgeons had been granted the right of dissection under their original "Seal of Cause", and had insisted that the Fellows of their Incorporation "knew anatomea nature and complexioun of every member In manis bodie", the first serious attempt to establish a regular course of anatomical instruction in Edinburgh was made in 1694. Alexander Menteith, who was twice Deacon of the Incorporation of Surgeons, approached the Town Council with a view to obtaining a more regular supply of anatomical material. In return for more adequate facilities the surgeons undertook to build an anatomical theatre. Here public dissections were carried out. These were only to take place in the winter, between the two equinoxes, and the body was to be buried within ten days. Owing to the short time at their disposal, the work of dissection was divided among a number of operators. In 1705 Robert Eliot was appointed by the surgeons to instruct their apprentices and servants in anatomy. The Town Council later confirmed this arrangement and appointed Eliot professor in the Town's College (the University) at an annual salary of £15. He was succeeded in his chair first by Adam Drummond and later by John M'Gill. In 1720, Alexander Monro was elected to succeed M'Gill in the Chair of Anatomy. The son of an Edinburgh surgeon, he had studied under Cheselden in London and

Boorhaave at Leyden, and returned to the city of his birth, to be appointed Professor of Anatomy at the age of twenty-two. Alexander Monro has been called the "Father of the Edinburgh School". Round himself he gathered the group of teachers who came to form the original Medical Faculty in the University. Doctor St. Clair was Lecturer on the Theory of Physic; Doctors Rutherford and Innes on the Practice of Physic; and Doctor Plimmer on Chemistry. With them were associated Doctor Alston, the Professor of Botany and *Materia Medica*, and Doctor Joseph Gibson, the first Professor of Midwifery. Alexander Monro died in 1767. He was succeeded in the Chair by his son Alexander Monro *secundus*, who did much to enhance the rising reputation of the Edinburgh Medical School. Alexander Monro *tertius* succeeded to the Chair in 1798. He was the last of the Monro dynasty, which taught Anatomy in the University of Edinburgh for 126 years. Being an unpopular lecturer, the students flocked to the classes of the extramural lecturers, Barclay, Knox, Lizars, William Fergusson and Robert Liston. After Monro *tertius* came John Goodsir. To him Virchow dedicated his "Cellular Pathologie", describing him as one of the most acute observers of cell-life. William Turner succeeded him in 1867. His students carried his teachings far and wide and filled chairs of anatomy in all parts of the world. Ultimately he became Principal of the University of his adoption, in which he had taught for over forty years. He was followed by D. J. Cunningham, who was succeeded in his turn by the present incumbent. Professor Robinson has occupied the Chair since 1909. He is a graduate of Edinburgh University and was formerly Professor of Anatomy in King's College, London. In 1904 he was elected to the Chair of Anatomy in the University of Birmingham and from there he came to Edinburgh. He was awarded the Neill Prize for the period 1925-7 for his work on comparative mammalian embryology. It was remarked at that time that he had done much to raise the level of anatomical science in this country and abroad, thus adding to the reputation of the Chair of Anatomy in Edinburgh, so well established by the Monros, Goodsir, Turner and Cunningham.

The Henderson Trust Lecture was delivered in the University on January 30th by Dr. G. Elliot Smith, Professor of Anatomy in the University of London. He told the story of the discovery of the Peking Skull, "the most significant and illuminating relic of early man that has ever been discovered". He described the finding of the fossilized human tooth among a collection of "dragons' bones" bought in a Chinese druggist's shop in Peking, and how this caused Prof. Max Schlosser, of Munich, as long ago as 1903, to suspect the former presence in China of a Pliocene or early Pleistocene man-

like ape or ape-like man. The lecturer gradually unfolded the various steps which led to the recovery in 1929 of the uncrushed brain-case of *Sinanthropus Pekinensis* by the young Chinese geologist Mr. W. C. Pei. The lecture was illustrated by lantern slides and the large anatomy classroom was crowded to the ceiling by a deeply interested audience.

Prof. Robert Muir, LL.D., F.R.S., who has for many years occupied the Chair of Pathology at Glasgow University, has been presented with his portrait in oils. The picture is the work of Mr. G. Fiddes Watt, R.S.A., one of Scotland's leading portrait-painters. In addition a bust of the professor by W. G. H. Paulin, A.R.S.A., was presented to the University to be housed in the pathological department of the Western Infirmary, with which Professor Muir has been so long associated. These gifts were contributed to by past and present colleagues and students, pathologists and workers in other fields of science and admirers of Prof. Muir, his work and his personality. The presentation was made on behalf of the subscribers by Sir Frederick G. Hopkins, LL.D., President of the Royal Society. Professor Muir is a graduate of Edinburgh University. He was formerly senior assistant in the Pathological Department in Edinburgh and Professor in the University of St. Andrew's.

The Morison Lectures at the Royal College of Physicians, on subjects connected with mental and nervous diseases, were delivered on the 9th, 11th and 13th of February by Dr. D. K. Henderson, F.R.F.P.S., the Physician-Superintendent of the Royal Mental Hospital at Gartnavel, Glasgow. Doctor Henderson chose as his subject "Social psychiatry".

St. Andrew's University has sent congratulations to Dr. W. W. Keen, of Philadelphia on the occasion of his 94th birthday. The honorary degree of LL.D. was conferred upon him by Scotland's oldest university in 1911, at the celebration of the 500 anniversary of the foundation of the University. Dr. Keen's longevity is almost matched by that of Emeritus-Professor M'Intosh of St. Andrew's University, who is well over 90 and is still busy with scientific work. Dr. Keen is an Honorary Fellow of the Royal College of Surgeons of Edinburgh.

Edinburgh has lost one of her most devoted sons, and the College of Physicians one of its most renowned Fellows, by the death of Sir Andrew Balfour, K.C.M.G., Director of the London School of Hygiene and Tropical Medicine. In 1902 Andrew Balfour went to the Sudan as director of the Wellcome Research Laboratories and medical officer of health to the City of Khartum. He found the Sudan a virgin field for scientific work of preventive medicine. He transformed the insanitary ill-kept city of Khartum into a model place of residence, with malaria banished entirely from

its precincts. In 1913 Balfour returned to London to found the Wellcome Bureau of Scientific Research. In 1923 he was appointed to the directorship of the London School of Tropical Medicine and Hygiene. Andrew Balfour served with outstanding distinction during the war. It has been said that he saw service in nine different fronts. He did an enormous amount of good work in coordinating scientific effort and in devising new methods of sanitation. In his early days Balfour achieved a considerable reputation as a novelist. One of his best historical novels, "To Arms", centres round the early teaching of anatomy in the Edinburgh Medical School. As a sportsman Andrew Balfour was well-known. He was a noted Rugby football player, and represented Scotland in the international games of 1896 and 97. At the time of his death he was president of the Scottish Rugby Union.

GEORGE GIBSON

23 Cluny Terrace, Edinburgh.

The London Letter

(From our own correspondent)

Lord Moynihan is the sort of man whom newspaper editors prefer, for he seldom makes a public utterance which is not only full of "human interest" but also usually stirs up a good controversy. The latest was recently in the House of Lords, when Viscount Astor "called attention to the needs of the dairy industry," principally with a view to increasing the consumption of milk. Lord Moynihan rose to support Lord Astor's plea for an increased milk supply but with "certain qualifications". As he developed what he meant by these qualifications it was obvious that the dairy industry was not going to be pleased. However, the facts must be faced. Milk is contaminated in several ways, which he enumerated; many diseases are spread by such milk, and of these he naturally stressed surgical tuberculosis. It has been estimated that 40 per cent of the cows of our dairy herds producing milk for human consumption are suffering from tuberculosis, and the nation has to spend something like £250,000 daily on the treatment of all forms of tuberculosis. Lord Moynihan suggested that there were but two remedies; all milk must either be boiled or pasteurised. In point of fact, so-called pasteurization is widely practised in certain large towns. In London, for example, 90 per cent of all milk is so treated, but there is a widespread feeling that the machinery for this process is not so efficient as it might be. Lord Moynihan quoted certain Canadian figures in support of his contention that adequately controlled pasteurization can render milk safe, and he pleaded for further inquiry into the conditions under which milk is produced and supplied to the consumer in this

country. Not surprisingly, the milk industry has resented this onslaught on their methods and protests have as usual taken the form of letters to the press. Nevertheless, Lord Moynihan's plea for pure milk as a not impossible ideal is bound to receive support, especially at a time when several important pieces of research have clearly shown the unique value of milk in the nutrition of the nation.

The early months of the year always hold certain terrors for the public health authorities since epidemics seem to favour January and February. This year has been no exception, but in addition to the influenza prevalent over northern Europe England has also been faced with small but alarming outbreaks of paratyphoid fever and cerebrospinal meningitis. The outbreak of "paratyphoid B" lends weight to Lord Moynihan's arguments, for the infection was traced to a dairy farm in the district—one of London's dormitory areas—and the trouble seems to have been due to one of the employees of the farm who, unknown to himself, was suffering from a mild attack of paratyphoid while at work and handling the milk before its distribution. In the first fortnight of February 172 cases of this fever were reported, and there were 4 deaths. Despite this low mortality, it is scarcely a satisfactory state of affairs that "dirty milk" can be allowed to cause so much disturbance of health. The small outbreak of cerebrospinal meningitis has been mostly confined to certain barracks or camps of the army and air-force and seems to have followed the usual lines, that is, to have been somehow or other associated with the prevalence of influenza, and the cases have been scattered in various units. There has been a slight increase in the total number of cases notified to the public health authorities during the last few weeks, and local outbreaks among civilians have been reported from Yorkshire. It seems certain, among a large collection of contradictory observations, that overcrowding is the main factor in causing the spread of "spotted fever" and it seems again unsatisfactory, to put it mildly, that even small epidemics should be allowed to occur.

In London it is estimated that nearly two million new out-patients have attended the hospitals yearly during the last few years and the total number of old out-patients is truly colossal. The British Medical Association has issued a valuable report by the Council on this problem of the out-patient, which reviews the situation and suggests remedies. Out-patients are divided into four groups: casualty, "chronic ordinary", consultation, and discharged in-patients. Obviously, accident and emergency cases under the first group must continue to be an important feature of out-patient work. "Chronic ordinary" cases, it is suggested, can for the most part be referred back to a private medical practitioner, insurance practitioner, public medical

service, provident dispensary, or public assistance officer. No doubt this can be satisfactorily managed, but, as thus baldly stated, the plan smacks of the "passed to you, please" gambit, so well practised in the war. Consultation cases, when properly introduced by a "doctor's note", are to be the main object of interest for out-patient workers, while discharged in-patients are to be carefully sifted. This short summary may not, perhaps, do justice to the Council's report, but it is to be regretted that no mention is made of the possibilities of an "appointment system" whereby the poor out-patient does not have to wait hours in a draughty waiting-hall. Otherwise, the proposals seem all to the good, provided the profession as a whole will loyally cooperate.

ALAN MONCRIEFF

London, March, 1931.

The New Zealand Letter

(From our own correspondent)

Towards the end of last year Dr. T. H. A. Valintine, C.B.E., the first Director-General of Health of the Dominion of New Zealand, reached his sixty-fifth birthday and resigned his appointment. Dr. Valintine is a Sussex man, who was educated at Marlborough and St. Bartholomew's Hospital, and began the study of Public Health in England, where he took the D.P.H. He came to New Zealand in 1891 and was in general practice there till 1900, after which he entered the Public Service; he was closely associated with the late Mr. Seddon when Premier. In 1902 he became Assistant Chief Health Officer. In 1907 he was promoted Inspector-General of Hospitals, in 1909 Chief Health Officer, and in 1920, on the reorganization of the Department, he received the title of Director-General of Health. He is now retained on salary in an advisory capacity. To quote from the *New Zealand Medical Journal* of October, 1930, "The Health Department has expanded greatly under Dr. Valintine's control, and he has left behind him a very worthy record. His general outlook on the whole was conservative, although he was a bulwark of the hospital system in New Zealand which is largely socialistic in policy . . . The retiring director has the respect of the profession for the long, faithful and efficient service he has given." He is succeeded by his Assistant Director, Dr. Michael H. Watt. The Health Acts which have been passed in New Zealand were briefly summarized in a previous letter (August, 1930), and the Act of 1909, the "Hospitals and Charitable Institutions Act", which established the existing system of Hospital Boards, is commonly spoken of as "Valintine's Act".

The development of Preventive Medicine in

New Zealand was reviewed by Dr. Watt at a meeting of the New Zealand Branch of the British Medical Association in 1929. Preventive Medicine first received serious Parliamentary consideration here in an Act of 1872, which was the joint result of the important English Local Government Board Act of 1871, following the report of the Royal Sanitary Commission, and of a local outbreak of smallpox. This Act was amended in 1876, much on the lines of the English Public Health Act of 1875, and provision was thus made for the reception of cases of cholera and smallpox, and for the notification and isolation of other infectious diseases and for disinfection.

In 1900 there was public alarm about plague, which appears to have been the main stimulus for a further Act of that date, which was referred to as "the most complete and comprehensive of any that has been placed on the Statute Books of an English-speaking country". It was characteristic of the progressive spirit of the legislation of the period. This Act, with various amending and consolidating Acts, dealt with the sale of food and drugs, with hospitals, poisons, and the registration of doctors, nurses and others. The pandemic of influenza in 1918 indicated various deficiencies, and the very elaborate Act of 1920 established the Board of Health with nine separate Divisions. This arrangement involves a great deal of centralization, but maintains a uniform and high standard of sanitation throughout the Dominion. An example of its efficiency is cited below.

All ordinary statistical records show that the sanitary activities thus initiated and maintained have been satisfactory. The standardized death rate fell from 12.36 per mille in 1872 to 7.72 in 1927. The infant mortality is said to be the lowest in the world. As elsewhere, there have been very satisfactory and uniform falls in the mortality from tuberculosis, typhoid fever, diphtheria, scarlet fever, measles and whooping cough. The world-wide modification in the character of several of these diseases has also been apparent in New Zealand.

Health departments notwithstanding, it is the view of those responsible at the University of Otago that the chief evangelist of Public Health in a community which is in the main agricultural and pastoral is and must be the general practitioner. It is for him to observe and advise upon dietetic and sanitary defects and the like. Further, it is essential for the rising medical generation to recognize the increasing weight of this subject in political programs, and the increasing employment of practitioners in works and factories in a preventive capacity. At Otago there is a combined Chair of Bacteriology and Public Health, and its incumbent, Professor C. E. Hercus, D.S.O., learned the importance of preventive medicine in a hard school, as a medical officer in the Gallipoli and

Palestine campaigns. The men who survived those experiences saw the unsuitable rations, the imperfect water conservancy and sewage disposal, the plagues of flies and mosquitoes, and the understaffed and undischarged sanitary discipline of Gallipoli displaced by the additional food from the Expeditionary Force Canteens, portable latrines and incinerators, mosquito-proof bivouacs, and an ample sanitary staff, which permitted the "Anzac" Mounted Division to spend a year in the Jordan Valley with a tolerably clean bill of health.

Familiar with, and having contributed to, this striking object lesson, Dr. Hercus has based his course of Preventive Medicine upon the writings of Sir George Newman, Chief Medical Officer to the Ministry of Health, but he has introduced one very special departure in practical work. In place of term- or class-examinations in the subject, the students present a thesis, each on some approved subject in preventive medicine, which has to embody a year's study; as a rule the students work in pairs, each pair presenting a joint thesis. The subject is chosen, after consultation and discussion, before the long summer vacation of three months, during which time the main investigations are carried out; at the beginning of term the rough data are collected and discussed and suggestions are made as to where to extend and what to verify. The thesis has to include the history of the subject chosen, and is intended among other things to be a training in the use of the library.

A remarkably wide range of subjects has already been investigated in this way. For instance, in epidemiology, "The Epidemiology of Scarlet Fever in New Zealand" has recently been presented in 200 closely written foolscap pages, and there have been similar studies on typhoid fever and diphtheria. In housing, cases of rickets and tuberculosis occurring in hospital have been followed home and investigations carried out on the houses and the family diet. There have been several theses on "Water Supply," the latest being on that of one of the largest cities in the Dominion, elaborately illustrated with photographs of dams, reservoirs and kindred objects, and including accounts of the methods of chlorination, filtration and reticulation, together with a study of a water-borne epidemic, and an excursus into the B.C.C. content of the water used in butter factories. In industrial hygiene and the hazards of industry work has been presented on lead-poisoning in Duco-spraying and the painting of motor cars, on tuberculosis among quartz miners, and on chrome-poisoning in wool-workers at a local factory.

In the School Medical Service the architecture, ventilation and lighting of schools, the incidence of mental deficiency, and the response

to the Schick test are among the subjects dealt with. In regard to thyroid disease, the results of using iodized salt of particular strength have been estimated in the closed community of an orphanage. A survey had been made of the local Wine Industry, copies of which were asked for by representatives of viticulture in South Australia. Hydatid disease has naturally been studied, and in that connection important, if unsavoury, investigations were made of the fæces of domestic dogs, as contrasted with sheep-dogs, which demonstrated the harmlessness of the former. Interesting studies have been made on the Maoris, including a survey of the tribes, their housing, and their vital statistics.

Much of this work is of course only academic exercise, but a good deal of it is considerably more. The greatest pains and interest are generally taken in the work and remarkable industry and resource are often displayed. The Professor of Public Health has been put into the profession of much highly valuable information by this means. Unfortunately, in the great majority of instances it is impracticable to publish it.

The length of this letter is extended beyond the usual limits on account of a recent occurrence which has subjected the Health Administration of New Zealand to a severe strain, namely, the earthquake which has recently shaken Hawke's Bay, an important agricultural district on the east coast of the North Island, and has constituted a peace-time disaster of a magnitude which would have been considered a calamity in war.

On February 3, 1931, at about 11 a.m. a severe earthquake shook this district. It is estimated that the shock lasted about a minute and a half, and in that time practically the whole of the business quarters of Napier and of Hastings, fifteen miles distant, was destroyed. The population of Napier is about 18,000 and that of Hastings 12,000. After the earthquake numerous fires broke out and the destruction was completed, Napier had the appearance of a town that had been shelled, and heavily shelled. The hospital, which contained some 200 patients and the corresponding staff, was seriously damaged; it is in fact wrecked. One ward was completely demolished, with numerous casualties among patients and nursing staff. Fortunately, many were on the verandahs, and for actual loss of life the institution came off comparatively lightly. The wooden structures were uninjured, but the new Nurses' Home, of five storeys, was reduced to a heap of bricks, and most of its occupants were killed. The response to the disaster throughout the community was magnificent. *H.M.S. Veronica*, a sloop, was fortunately in harbour; she immediately communicated by wireless with Wellington, and

landed her men and equipment. It is said that the sight of the uniformed, disciplined men went very far to restore confidence, and all agreed that the work they did was beyond praise.

As to the handling of the very numerous casualties, within an hour of the shock three of the hospital staff and residents had established an Advanced Dressing Station in the Botanical Gardens, the hospital buildings being quite out of action, and the surgeons were at work with an operating table from the theatre. One of the staff had just completed an operation when the shock occurred; his car was wrecked, so he started on foot to his private hospital, and he arrived there before the fire broke out which soon afterwards destroyed it. He commandeered every available vehicle on the way, got out his patients and his hospital gear, took over an empty house three miles distant, re-established everyone as comfortably as before and took in fresh casualties. Meantime the superintendent of the hospital had arranged that the race course—four miles away—should be commandeered, and in three hours this was established as a Main Dressing Station with four tables, all working, and a hundred beds. Next day, some sixty doctors had arrived from outside districts—far more than could be employed. The Health Department sent up the full equipment of a Field Hospital and Staff from Trentham, the Army Medical Headquarters; this was set up on the race course and functioned as a casualty clearing station. *H.M.S. Dunedin* and *H.M.S. Diomedé*, the cruisers of the New Zealand squadron, arrived, and helped with man-power and equipment.

The town water supply was disorganized and the drainage system wrecked, but someone with wells near the race course supplied the casualty clearing station, and the Public Works Department speedily had things repaired. Within three days the trains were again running, in spite of great injury to the railway line. The Navy had commandeered all the meat in the town, and rationing went on satisfactorily. Neighbouring towns indicated what patients they could take, and in a week ambulance convoys had removed 1,500 patients from Napier and 1,000 from Hastings. It will be seen that nearly 10 per cent of the population of these towns were so injured as to require hospital treatment and evacuation, in addition to some hundreds of deaths.

Observers are agreed as to the magnificent behaviour of all persons involved, and of the generosity displayed. Public order was maintained throughout. Doctors and nurses worked night and day; one girl remained on duty for two days and a night before reporting a wound of the head. Within two hours a hotel-keeper, the side of whose hotel had fallen out, was seen dispensing drinks over his counter—free.

The responsibility for dealing with this disaster rested with the Health Department. Red Cross workers from the North Island centres of Auckland and Wellington were on the ground in twenty-four hours. A chlorinating plant arrived immediately by aeroplane, together with T.A.B. vaccine and anti-gas-gangrene and anti-tetanic sera, which were requisitioned from all hospitals, and six District Medical Officers of Health and their inspectors were in attendance the day after the shock. As soon as the magnitude of the disaster was known, at midnight on the date of its occurrence, the Medical School offered help, and at 2 a.m. the following day the Department telegraphed that everything was in order. I have it from the hospital superintendent that the Department's organization has been admirable and that they have given every help, and kind help. He has felt that they have approved of his arrangements and that they have been behind him; he had only to ask and they supply. For instance, he asked for bath facilities, and immediately the Department established showers for him. The Superintendent is an Englishman, of not very long residence in the Dominion, and with all the prejudices of his race; he remarked "No one could have been more capable or kinder than the Health Department, and I want everyone to know it", and finally "I do not believe that any country in the world would have faced this disaster more efficiently than New Zealand has done."

D. W. CARMALT JONES.

Dunedin, N.Z.

Letters, Notes and Queries

WHO PAYS THE DOCTOR?

[The following letter to a local paper has been sent us by our correspondent in Saskatchewan. Ed.]

"A recent reference appeared in provincial debates, in which it was stated that special provision for the payment of medical attendance was not necessary, as applied to the disposal of relief funds, since 'provision was already made elsewhere on behalf of the medical profession.'

No such provision has yet been made nor likely will be made which will protect medical practitioners serving rural districts. Obviously, judging from personal experience, the average doctor must be satisfied to contribute about one-third to one-half his year's work in gratuitous service to the public, particularly the rural public, since neither the municipal nor provincial authorities will make any active move to remunerate him for the services extracted on credit terms, which constitute a valueless asset in his ledger.

The past year has proved the worst of any in

bill-collection, and this present year bodes ill to the practising profession unless drastic action by legislature supervenes, and there is no present indication that there will be any. Other professions are able to get their just dues upon a cash basis, but, theoretically, because of ethical reasons, the doctor is not supposed to work upon those terms.

Usually after the horde of commercial collectors are through, there is nothing left to pay the doctor's bills, so he is left to carry on the best he knows how. The average community accordingly must 'pay the piper' by securing poorer medical service, since by cramping the doctor he cannot achieve the results that proper maintenance from his patients would assure. The Bible speaks suggestively about 'muzzling the ox that grindeth out the corn.' The selfish-minded Saskatchewan public is doing worse than that. Another Scripture saying comes to mind, 'All that a man hath will he give for his life.' Usually they are ready enough to cash up before they get the service, but when the stress of physical danger is past, they buy a new car with the money they owe the doctor.

We have a highly-paid public health department. This is supposed to function as an agency to prevent disease. On practical grounds they will present nothing without the cooperation of the medical profession of the province. Therein rests an anomalous condition. The doctor in ordinary circumstances, if he worked like the tradesmen, would do absolutely nothing to prevent disease, since his income is dependent upon the volume of practice he attains in treating sickness. Nor would he if he worked as the trades do be in any hurry about effecting a cure. The practical answer which stares humanity right in the face is to put the doctor's business where it properly belongs, and establish state medicine as the practical solution of the relationship of the medical profession to the public. Portions of Saskatchewan have made a partial move in that direction by means of provision for employing municipal doctors. The other method of partial aid is satisfactory neither to the doctor nor the municipality, as the writer has ample reason to know. The limited grant of \$1,500 which induces a doctor 'to reside and practice within the limits of a municipality' is construed by the ratepayers as a salary which frees them from the obligation of paying a legal schedule of fees. They don't take into account the fact that the minimum actual cost of a rural practice will exceed \$2,000 annually—and might easily exceed \$4,000 without any kind of extravagance or display. Two thousand dollars would be the minimum figure for an unmarried man, and without supply of medicines, which alone mean outlay of \$500 in an average practice.

The writer resides in a district covering roughly seven municipalities, with a total population of 1,700, and only one organized unit. The nearest competing doctor resides 40 miles away and deals only with a narrow fringe of this

territory, a portion not readily accessible by road or wire communication with this district. For most of this territory, so far as my practice is concerned, I have no guarantee whatever for the credit I may extend, and as a result of 10 years' practice, more than \$15,000 is already written off as worthless, and represents amounts which even by legal process could not have yielded any returns. During 10 years' work I have received \$1,000 in niggardly provincial grants and \$6,500 in municipal aid, the total of which falls far below adequate compensation for the amounts literally stolen from me in the way of free service.

Returning to this question of provincial remuneration for relief service, I am informed that all services to the indigent must be arranged beforehand by reference to Health Department, or deputy minister municipal affairs. How does this apply to a call in middle of night in a case of urgent danger? At least three days would be needed from this centre to arrange for authority. By that time an unattended patient might be on way to cemetery, and poor me held up to obloquy as potentially guilty of manslaughter because of refusal to attend where needed. Who are the indigent, pray? Just now, about 75 per cent of this district are in practical need of relief, and there is certainly no money in sight to pay medical fees, owing to the state of farm affairs. Yes! It will require no trouble at all to find the indigent! Meanwhile, who is going to pay the doctor the lawfully earned fees he cannot collect and which, out of common humanity, he cannot refuse to earn. Casually, also, how much longer must he demean himself by the irrational system of practice which puts one doctor against another competitively for the public patronage? The nature of the doctor's business, as an agent to promote public health, most certainly forbids such competition, and the world at large is the chief sufferer from the system now in vogue. State medicine is coming, but it should have been established long ago. More especially will it apply to the West, where it is most needed. I can easily find a score of people badly in need of operative treatment of one kind or other, or dental service which they cannot secure because of lack of funds, hence must drag along a weary existence in hope of better days, if perchance they live that long. The writer is about to instal the cash-and-carry plan—the first time in 25 years of practice—but it is forced on him by existing conditions, and obligatory although unpalatable. No practical relief can ever be expected from municipal or provincial sources. Accordingly, there is much curiosity about the correct interpretation of the measures which officially constitute provincial medical relief, and whether there is any serious intention of making it available to bona fide services."

Vidora, Sask.

R. M. JOHNSTONE, M.D.

March 2, 1931.

The Late Professor Teacher

To the Editor:

I should like to add a few words to your appreciative notice of my old friend and classmate, the late Prof. J. H. Teacher, of Glasgow. I have, as yet, seen no reference to Dr. Teacher's prolonged and serious search for the parasite of syphilis. How I know that he was engaged on this search was through his calling on me at the University of St. Andrews and telling me so. Like a blind man, he was led into the room by his wife, and he at once explained that he was suffering from photophobia and a considerable degree of loss of function of the retina. He then told me that for some months previously he had been constantly searching for the parasite of syphilis, subsequently found by Schaudinn in 1905. The date of this visit must have been early in 1904, so that Teacher was working on the *spirochæta pallida* almost exactly at the same time as its discoverer.

D. FRASER-HARRIS.

London, March 9, 1931.

Topics of Current Interest

BCG at the Paris Academy of Medicine

The scientific calm of the Académie de Médecine was broken on January 20th by Dr. Joseph Lignières, professor of bacteriology in the Veterinary Faculty at Buenos Aires, when he made a comprehensive attack upon the reputation of the Calmette vaccine. Judging by contemporary lay and medical comment in Paris it might be thought, he said, that BCG had received a final blessing throughout the entire world. The truth, however, was otherwise, and at no congress had any vote on the merits of the vaccine been taken—an act of prudence on the part of its sponsors. In particular he regarded as improper Calmette's employment of the total figures of infantile mortality; the report from Roumania of a fall in infant mortality from 25 to 2.3 per cent was inadmissible. At the International Congress of Pædiatrics in Buenos Aires last year the proposal to extend BCG vaccination to all new-born children did not gain a single voice. After this preface Prof. Lignières remarked that evidence was steadily coming in to show that the BCG strain is not definitely fixed. He described the results of Dreyer and Vollum, published in our own columns, as a confirmation of those of Petroff, and went on to speak of a long series of cultures, made by himself in 1929-30, in which, when egg was added to the medium, some of the cultures regained the property of producing progressive lesions in the guinea-pig.

It was, however, a curious fact that the cultures which produced these lesions when cultivated anew on the same medium did not become more virulent; sometimes, indeed, the guinea-pigs which received them recovered from their lesions as after the non-virulent BCG. Turning to the Lübeck catastrophe, he remarked that Calmette, and the German investigators after him, were perfectly right in affirming that the classical BCG vaccine had nothing to do with it. The suggestion that non-virulent BCG had been mixed with a subvirulent human strain was, he said, not impossible, however unacceptable to laboratory workers; but he went on to make the remarkable statement that certain information collected at the Lübeck laboratory would suggest that the vaccine had been cultured at Lübeck on an egg-containing medium—which, if confirmed, would logically explain the tragedy. It would seem, he said, that Prof. Bruno Lange, in discarding the possibility of spontaneous recovery of virulence, was still impressed with the possibility of recovery of virulence from other causes. It was in this direction, said Prof. Lignières, that his own work was leading. Whatever the reason, the German Government continued to maintain its prohibition of BCG, and the same was true of Chile. Finally he came to his trump card—namely, the discovery by Dr. E. Hormaeche, professor of bacteriology at Montevideo, in collaboration with J. E. Mackinnon, of a means of conferring virulence at will on the classical BCG. In a paper published in the annals of the Faculty of Medicine Hormaeche had shown that in guinea-pigs previously inoculated with a streptococcus the BCG vaccine produced tuberculous lesions which after the third passage were progressive and tended to generalise. Once isolated this virulent BCG preserved its pathogenic qualities. Immediately he heard of this work Prof. Lignières obtained Hormaeche's streptococcus and permission to repeat his experiments, which his own results corroborated as far as they went. While he did not think that all types of streptococcus would augment the virulence of BCG, Hormaeche's observation would explain the occurrence of lesions in certain subjects after vaccination with BCG. This completed the long chain of evidence which justified him in counselling prudence and in reserving the Calmette vaccination for infants living in a tuberculous environment. The importance of the Calmette-Guérin discovery was patent, but before the vaccine became universal it would have to be rendered absolutely inoffensive. Prof. Léon Bernard having replied with some asperity that no congress ever took a vote on a scientific discovery, that Prof. Lignières himself had had a share in the employment of BCG to immunize cattle, and that the veterinary commission organized in Paris by the League of Nations had recognized the absolute innocuity of BCG, Prof. Lignières refused to surrender any part of his strategic position.—*The Lancet*, 1931, 1: 308.

The New Mercurial Diuretics

The value of novasurol and salyrgan was discussed at a meeting of the Section of Therapeutics of the Royal Society of Medicine on Dec. 9th, 1930, when Dr. Philip Hamill presided. Dr. Evan Bedford and Prof. F. R. Fraser were able to testify to the efficacy of novasurol as a diuretic, but Dr. Strickland Goodall thought that the reduction of oedema after its use is due to loss of fluid by way of the alimentary canal. Often, he said, this drug produces a severe toxic diarrhoea, and he handed round two specimens showing sections of gut in which the mucous membrane was inflamed and sloughing as a result of the exhibition of novasurol. Dr. Bedford, however, was able to give a reassuring account of salyrgan, which he had first begun to use 18 months ago, and which he regarded as considerably less toxic than novasurol. His method is to give 2 c.cm. of the 10 per cent solution diluted with 10 c.cm. of sterile saline, by intravenous injection; in this dilution he has never seen thrombosis of the vein following the introduction of the drug. In his opinion, it is unnecessary to stop digitalization while salyrgan is being given, and he always accompanies the treatment with grs. 15 of ammonium chloride given by mouth three times daily to aid diuretic action. Fluids should be restricted to daily intake of 3xx. to 3xxx. Using this technique, among 27 cases of cardiac failure with oedema he has only had three failures, and the three patients in question were moribund at the beginning of treatment. He quoted several of his cases in which the diuresis following salyrgan was marked; some of them lost 40 lb. or more in weight in a month. So far, he said, no toxic effects have been observed, but he thinks the chief value of the remedy is in cases of cardiac oedema. Though it is supposed to act by diminishing the affinity of the tissue colloids for water and sodium chloride, there is some evidence that salyrgan also has a direct action on the kidney, and for that reason its use is less desirable in oedema due to nephritis. While none of the other speakers could produce quite such dramatic results as Dr. Bedford, several were able to quote cases where salyrgan had promoted diuresis and reduced the oedema in cardiac cases. Dr. D. H. Kotthoff, of Vienna, stated that many good results had followed its use among cardiac cases in Austria. It was agreed by the majority that both novasurol and salyrgan should be avoided in oedema of renal origin; but Dr. Izod Bennett held that, although they are dangerous where the kidney is seriously injured, in cases which show gross pitting oedema with a normal blood pressure and blood-urea, salyrgan may be useful and is probably safe. Dr. Kotthoff shared this view. The use of salyrgan in the diagnosis of Ménière's disease was mentioned by Sir James Dundas-Grant and Dr. Warren Crowe; there is some evidence, Dr. Crowe said, that people with Ménière's disease have a mild degree of water retention, and that

they react differently from normal persons on being given water and salyrgan together. The ultimate value of treatment by novasurol and salyrgan was discussed pessimistically by Prof. Fraser, who considered that those patients with heart failure serious enough to merit the treatment were so much wrecked in health as to profit little by the disappearance of oedema. Dr. Bedford, while sympathizing to some extent with Dr. Fraser's view, pointed out that the patients themselves place a high value on their increased comfort, even to the extent of attending regularly at the out-patient department for a weekly injection of salyrgan.—*The Lancet*, 1930, 2: 1306

Thallium and its Risks

A very interesting case of thallium poisoning was recently reported by Dr. John Lansbury at a staff meeting of the Mayo Clinic. He was called to see in consultation a lady, aged 38, with severe abdominal pain and a slight maculopapular eruption. The skin of her legs was warm and scaly, and so rough that it suggested ichthyosis. On the feet were dry calluses, which were beginning to peel. The hair was loose and easily pulled out. Five days later the unhappy patient had become almost bald, except for a thin fringe round the margin of the scalp. The body hair also fell out to some extent, but the eyebrows and eyelashes were not affected. Later the pain subsided, the texture and functions of the skin returned to normal, and the hair began to grow again. Struck by the way in which the skin had been affected, and especially by the remarkable loss of hair, Dr. Lansbury at once suggested the possibility that this was a case of thallium poisoning, and his diagnosis was amply confirmed by the discovery that for about five weeks the patient had been using a depilatory cream on her face. This cosmetic was analyzed and found to contain a large percentage of thallium, but no lead; the absence of lead is noteworthy in view of the severe colic from which the patient suffered. The poisonous qualities of thallium have been known ever since the element was first discovered in 1861, and many attempts to employ it for therapeutic purposes have been associated with accidents to the patient which, until recently, have prevented its acceptance as a remedy, although tentatively tried for several purposes. These drawbacks have now, it is true, been so successfully overcome that within recent years many thousands of children have been treated for ringworm of the scalp by the single dose method. It must be admitted, however, that even this is not without its dangers, especially to children over the age of 6 years, and a good many cases of poisoning, some fatal, have been recorded; but besides the case mentioned above we have only heard of one other (reported by Ramond) in which thallium, employed in the form of a cream for the treatment of hypertrichosis, has been followed by toxic sequels.

The pharmacology of thallium has been investigated by Professor W. E. Dixon, who has pointed out that the chief characteristic of its action, shared by no other metal, is its effect on the autonomic nervous system. Just as strychnine encourages the passage of reflex action through the spinal cord, so thallium appears to facilitate the passage of stimuli in connection with the autonomic nervous system. The production of alopecia, which is so remarkable an effect of the administration of thallium, is unique in pharmacology; there is no other substance whatever, the absorption of which can do the same. According to Professor Dixon, thallium rubbed into the skin does not depilate locally; it is only after absorption that the metal affects the hair. If this be so—and there is no reason to doubt it—the employment of thallium in depilatory creams is highly dangerous; for the margin between the depilatory dose and the toxic dose is extremely small, and therefore the employment of thallium for this purpose should be strictly forbidden. The Board of Education has already interdicted its use in the treatment of ringworm in school children.—*Brit. M. J.*, 1931, 1: 320.

Health Propaganda

Some of the hygienic dove-cotes of America were noticeably fluttered last summer by Dr. Robert Hutchison's speech at Winnipeg on *The Pursuit of Health*.¹ Not only did Dr. Hutchison condemn this pursuit as above all things unhealthy, but he suggested that its well-meaning promoters are actually damaging the community by their efforts to create a "health conscience." The old ignorance about the body and stolid resignation to its ills was probably, he said, a more "healthy" attitude, and certainly a happier one, than the modern curiosity and over-anxiety. A high standard of physique does not necessarily make people more efficient and alert, and the emphasis now being laid on physical welfare is, he thinks, detrimental to what is far more important—namely, character. We are now producing hypochondriasis—individual, vicarious, and national. Those who seek to save their health are losing it in imaginary ailments and crankiness and fear. Parents fuss over their children, and children over their parents. Health societies, health weeks, popular lectures and articles, booklets, leaflets, slogans, and even the legislature, all play their part in increasing sickness by suggestion. And most of their propaganda is based on fallacies—the fallacy that health is hard to attain and keep, and the fallacy that it can only be got by following rules. The way of health, as Sir Thomas Horder has put it, is too often regarded as a tight rope along which we make a slow and trepidating progress; whereas it is really a broad and well-paved road, and the wayfaring man must be a

fool indeed if he errs therein. Only one health rule, said Dr. Hutchison, is universally applicable, and that is moderation—moderation in all things, even in being moderate.

These arguments, even in summary, are a challenge to an important section of our profession to show cause for its endeavours, and the challenger undoubtedly represents a large body of sane, if silent, opinion. In pointing out that health is only a means to an end, Dr. Hutchison and those who think with him would no doubt agree that physical fitness helps people to be sound in mind and temper, but they are vigorously reacting against a craze in which it has become self-conscious. So far, at least, so good. We should all admit that self-consciousness is as undesirable in personal hygiene as it is in personal virtue or learning. But is it not inevitable to a stage of transition? Are these objections to health teaching free from that obscurantist opposition which hinders every form of education because it sees the danger, rather than the promise, of a little knowledge? And is it true that medicine has nothing to offer the public beyond St. Paul's counsel of temperance? Faced with the distresses of modern society, must we remain silent about fresh air, fresh food, and flies? Is there nothing to be said about breeding and pregnancy and infancy and childhood? Must we really leave the slums to their unconscious health for fear a little enlightenment may make them over-anxious? To questions of this kind most of us will answer, No. We will grant that young and old do well to learn a few of the elements of physiology; we will allow the missionaries of cleanliness to preach their gospel over dustbins and dejecta; we will even countenance a few cautious words about diet, provided there is no mention of vitamins. But we will draw the line, and firmly, at any emphasis on *disease*. Just as the churches nowadays concentrate on goodness rather than sin, we shall illuminate the sanitary rather than the seamy side of life, and thus avoid the worst of that hypochondriasis which is so evidently deplorable.

Is this a possible compromise? The ideal is to raise a generation capable of rational living and free from neurosis because it sees the abnormal in terms of the normal rather than vice versa. If every serious deviation from health could be brought at once to the doctor as a matter of course, there would be no need for potential sufferers to be told about their potential diseases. But how are people to know what symptoms are serious unless they are specifically told about them? If we are to spot disease in its earliest stages we must either encourage the public to bring every trifling ailment for our consideration, or we must spread alarming information about those pathological conditions that are most commonly disregarded until too late. Either policy creates or increases hypochondriasis on a very large scale, and Dr. Hutchison would have us eschew them both. Most diseases, he says, either cannot be detected early, or, if they are,

1. *Canad. M. Ass. J.*, 1931, 24: 16.

little can be done to stop them unless one is prepared to give up for the sake of life, all that makes life worth living. That is Dr. Hutchison's view but it is inconsistent with the recurring cry for earlier diagnosis from physicians and surgeons, and gynecologists. The chief case in point, which illustrates the others, is cancer. In a lecture we published on Jan. 3rd, Prof. Beckwith Whitehouse said:

"We hear at times a certain amount of adverse criticism of cancer propaganda work and of the development of a state of cancerophobia in the middle-aged matron of today. Personally, I regard this as a healthy sign and a mark of progress. Without a certain amount of fear we shall not get women, especially of the uneducated classes, to submit themselves to the careful and detailed investigation necessary to ensure a correct diagnosis. . . . A very strong stimulus is necessary to make her seek advice. The only stimulus that we possess is cancerophobia, and for that reason I do not deprecate, I welcome it! Anyone, I am sure, would rather examine 100 women and cure their 'phobias' by proving there is no malignant disease present, than be in attendance during the last two or three months on some poor creature who thought that her symptoms were 'only due to the change.'"

Thus Prof. Whitehouse, like Lord Moynihan and many others, would make free use of fear as a weapon against the more physical disorders, and their arguments are certainly cogent enough. The British Empire Cancer Campaign, in its new handbook "The Truth About Cancer," is conspicuously unemotional and even reassuring; but its preface expresses a wish to spread an interest in cancer among those who are at present undisturbed about it. Almost everywhere in public health propaganda we find the same desire to shed an uncomfortable light among those that sit in darkness. "The public really are indifferent," writes Dr. John Macmillan,² medical officer of health for Woolwich. "There is little evidence, except possibly in the case of the expectant mother, that healthy adults desire education in health matters." He goes on, however, to speak of the value of lectures:

"It is said that only the converted attend such lectures, but that is not my experience. Different lectures attract different types of audiences. A lecture on cancer attracts the middle-aged; a lecture on venereal disease the young. The tuberculosis audience is totally different from the psychological audience. A lecture on diet exercises a fascination for the dyspeptic, while one on sunshine attracts a representative but, unfortunately, less numerous audience than any of the others mentioned. It follows, therefore, that various sections of the community respond to different stimuli, and it may be that if we are persistent in developing such stimuli so as to attract all classes of the community, this subsidiary importance of lectures will be invaluable.

2. *Public Health*, January, 1931, p. 147.

. . . The present methods of stimulating interest are so few that none of them can be neglected."

In his enthusiasm for instruction, Dr. Macmillan almost seems an artist for art's sake, and the sight of his modern picture makes one thankful to look again at Dr. Hutchison's more sophisticated undertones. Each in its own way lends colour to Dr. William Brown's assertion (to a church congress last year) that the *idea of being ill* is nowadays being implanted in the public mind and so realizing itself.—*The Lancet*, 1931, 1: 357.

The Lot of the General Practitioner

Physicians have been slow to realize that their practice is gradually being crushed to nothingness between two millstones: the one, state medicine, the other endowed institutions such as medical out-patient clinics. By State Medicine I do not mean such a complete system of civil service as is advocated by Dr. Haigh, but rather the gradual (and even more rapid) extension into the field of medical practice of the State Department of Public Health ("and Disease?"). Cancer clinics, tuberculosis clinics, rheumatism clinics—next in line will be heart clinics, diabetes clinics, anæmia clinics, thyroid clinics, etc., etc., These clinics are being put through so cleverly by the Commissioner of Health, always in response to an alleged "public demand," that they are upon us before we know they are started. How many physicians were present at the recent hearing of the Commissioner of Public Health on the institution of rheumatism clinics by the state? Exactly none.

The endowed institutions, sponsored and supported by millionaires with much surplus money are also increasing by leaps and bounds and thus represent the other millstone which is gradually crushing the much maligned practitioner. The large number of millionaires is resulting in the formation of one institution after another. These may compete with one another for patients, and in the eagerness for numbers, patients are being admitted not only from the poor stratum of society but from the middle class.

The practitioner should become mindful of these millstones. The medical firing line should be against the present extension program of the State Department of Public Health. If rheumatism clinics are not stopped now, we will have more and more clinics of various types. Again, if we are not mindful of dispensary abuse, it will increase so that the only practice will be among the rich, and a relatively few doctors can take care of that.

The writer urges that groups of physicians throughout the State organize themselves for the purpose of combating these evils. If this is done, possibly the Massachusetts Medical Society will awaken to what is going on and will strive to cooperate and mediate between the State and the practitioners.—William Dameshek, M.D., in the *New Eng. J. of Med.*, 1931, 204: 403.

Travelling Hospitals in Canada

The provision of adequate medical attention in the more remote districts of Canada has been a pressing problem ever since pioneer days. There was a time before the coming of the railway when the farmer and his wife on the frontier of the west had to rely on their own native ingenuity and common sense in the treatment of household ills. About three-quarters of the population of Saskatchewan is still rural, and not a small proportion lives in outlying districts to which the problem of bringing health services is difficult. Recently the provincial Government made provision whereby communities could obtain the services of doctors under a cooperative plan. One scheme empowers a rural municipality to make a grant to a medical practitioner as an inducement to him to take up his residence and practise his profession in the community, a grant of money up to \$1,500 being made to him for this purpose. The other plan is that which makes it possible for rural municipalities, by vote of the residents of the area, to engage a full-time practitioner at a salary not exceeding \$5,000 yearly. In this case the doctor acts as the community doctor, giving free medical service to all ratepayers and their families. Thirteen Saskatchewan municipalities are trying out the first scheme and 19 districts the second scheme, the ratepayers in the latter case paying a tax of something like \$3.85 per quarter section of 160 acres. In one or other of these ways there are now few communities which have no doctor within reasonable reach in case of emergency.

Many districts, however, still lack adequate facilities for the treatment of more difficult cases and for the isolation of patients suffering from contagion, or for the spreading amongst the population generally of elementary instruction in first-aid. It is to fulfill this function that the Canadian National Railways are placing in service on their lines three new hospital and first-aid cars. It is the intention of the management that these cars shall be used where hospital accommodation is limited and where a knowledge of first-aid is specially desirable. They will also be used in disasters, such as train wrecks and mine explosions, where speed in the provision of medical assistance is essential. The cars will be in charge of an experienced medical practitioner and will be hauled from place to place as occasion demands. In rural communities lectures will be conducted in the body of the car, illustrated by means of charts and moving pictures, on the subject of first-aid and elementary medical science.

The cars themselves are virtually travelling hospitals. They are 71 feet long and divided into six sections, including a locker room, a lecture room, and operating theatre, bathroom, kitchen, and sleeping quarters for the official in charge. The equipment includes a steel operating table, instrument cabinet, medicine chest, and racks with all kinds of splints. The lecture room has a blackboard and various charts and, when required, may be transformed into a con-

valescent or isolation ward. The living accommodation for the attendant is equipped with lockers and a small kitchenette. The bathroom in block tile has a shower. Plentiful provision of hot water is ensured by a 200-gallon tank placed on top of the car, connected with a heater. Three independent systems are used for lighting. The electric lamps may be lit by current supplied either from the car batteries or from an outside source while the car is standing in a siding; should both these fail, oil lamps present a third alternative.

The first car is already in service and the others will be completed shortly.—*The Lancet*, 1930, 2: 1328.

The Influenza Play—A Fifteenth Century Burlesque

The doctors are telling us that the best specific against influenza is laughter—but that is something which the citizens of Nuremberg discovered more than five centuries ago, during the great epidemic of 1414.

And if anyone doubts that 'flu was 'flu in those days here are the symptoms which the victims suffered: sneezings, snufflings, shiverings, coughings, with such pains in back and head that the disease was called *Tanneuechsel* or *Tannewitzel*—a blow on the forehead. Everybody caught it; no doctors could cope with it. The Emperor Sigismund wisely paid a visit to Rome to avoid infection. So the merchants of Nuremberg, where the epidemic raged worst of all, made a play of it—the Influenza Play.

A wooden stage was erected in front of the Town Hall, and the 'prentices were the actors, while the citizens crowded the market-place to watch the show. The scene represented a Court of Justice, and to the bar was summoned, as a prisoner, Messer Tanneuechsel, Mr. Influenza himself. He was represented as a weird, red-nosed, snivelling figure, a burlesque version of Messer Death, in the popular "Danses Macabres" of that day. And against him were called up a crowd of witnesses, his victims of all classes. When all had given witness Messer Influenza was called upon to plead for himself. He protested his innocence, vowed his so-called victims had brought their troubles on themselves.

What a modern ring it has!—for a play written five centuries ago. But no such specious pleas availed Messer Tanneuechsel; judgment was passed; the prisoner at the bar found guilty and sentenced to summary execution by the sword. He was led away by Messer Pausenhart, the Public Executioner, and a burlesque beheading followed, amidst the shouts of laughter which rose from the delighted audience as Mr. Influenza died the death. Quite possibly that laughter did them good—according to the latest medical opinion. In any case, it is recorded that the epidemic was stayed and that no more fell sick in Nuremberg.—From the *Weekly Times*, Feb. 5, 1931.

Medico-Legal

Legal Liability for a Steam Tent Burn

Recently a verdict awarding \$3,000 damages to the plaintiff was given against the Lord Dufferin Hospital at Orangeville, Ont., a 35-bed hospital maintained by the local chapter of the I. O. D. E. We understand that the suit was brought on behalf of a child who, while suffering from bronchitis, was placed in a steam tent and while there was accidentally scalded by hot water which apparently came up through the hose. The child made a good functional recovery, but unfortunately had a keloid tendency which necessitated an operation at the Hospital for Sick Children in Toronto for the removal of this keloid formation. Suit was instituted for \$25,000.

The point at law of interest to other hospitals is the responsibility of the hospital for the action of its personnel. The "master and servant" relationship, which is a recognized principle in law, establishes the responsibility of the hospital for the actions of any of its servants or employees. Thus it is generally conceded in a court of law that the hospital is responsible for the routine actions of its *pupil nurses* or *orderlies*. As these are employees working under orders from the hospital administrators, the maxim "*respondeat superior*" is applicable. An exception to this opinion might arise if the nurse were following faithfully the instructions of the doctor, especially if the alleged negligence were to occur in the operating room.

If a *graduate nurse* is accused of negligence, the liability of the hospital depends to a large extent upon whether the nurse is an employee of the hospital as, for instance, a supervisor, or whether she is engaged as "special" nurse, paid by the patient to supplement the ordinary nursing service supplied by the hospital. In the former case, the hospital may be required to share the responsibility, but in the latter case, even although the hospital may have engaged the special nurse on behalf of the patient, the nurse is temporarily the servant of the patient, not of the hospital, and the liability is, therefore, a personal one of the nurse to the patient. This point is of interest in connection with "group-nursing" which is gaining in favour in some of the large hospitals. The most feasible plan is to have the nurses doing group duty on the payroll of the hospital and, of course, by so doing, the relationship of master and servant is set up.

With respect to the alleged negligence of *physicians and surgeons* the responsibility of the hospital for their actions depends upon their relationship to the hospital. If the doctor be employed by the hospital as, for instance, where a hospital contracts to supply medical care, the hospital may be held liable for a share of the responsibility. But in the usual staff arrangements prevailing in the vast majority of the

public hospitals in Canada, the governors of a hospital are generally held to have fulfilled their obligations to the patient when they have used due skill and care in the selection of their medical staff. Having exercised this precaution, the hospital is not held liable (except in special contract) for any later negligence on the doctor's part, a negligence for which he alone is responsible.

In the case of resident physicians or surgeons, or interns, the interpretation of the law may not be so clear, as they are maintained by the hospital and often receive an honorarium for their services. However, while they are responsible to the hospital administration on disciplinary matters, their direct responsibility for their professional actions appears to be to the attending medical or surgical staff. Whether or not the attending staff or the hospital authorities can be held liable for the actions of the intern would be influenced by the master and servant relationship and by the professional responsibility of the intern for his own actions. It has been held that the hospital has discharged its obligations in this regard when, as in the appointment of the attending staff, it has exercised due skill and care in the selection of its resident staff.

First Aid in Street Accidents

In a recent trial for manslaughter at the Central Criminal Court the jury added a rider, which was endorsed by the judge (Mr. Justice Charles), reflecting upon the ambulance service of London. An ambulance had been called to an accident case at Greenwich, where a woman had been knocked down by a motor cyclist. She appeared to be suffering from concussion, and had scalp and face wounds, and while the attendant was bandaging the wounds as she lay in the roadway a motor car was driven through the onlookers, caught the patient, and carried her for several yards, one wheel going over her body. She died two hours after admission to hospital. The driver was charged with manslaughter, but was acquitted, and the jury said there was negligence on the part of the ambulance authorities, while the judge said that it was a wrong practice to bandage people in the middle of the road; the injured person should be removed to the pavement. Sir William Willcox, who had been called on behalf of the defendant, had given a similar opinion in the witness-box.

The Central Public Health Committee of the London County Council now states that the opinion of the judge and jury, and of Sir William Willcox, is not supported by medical opinion generally or by those who have experience of, or responsible for, ambulance services. It maintains that a principle in first aid is that the person apparently seriously injured should be allowed to remain in the place where he has fallen until he has been examined by a doctor or a person skilled in first aid. It is held to be extremely dangerous to move a patient who has sustained

severe head or spinal injuries before first aid has been given, and in this case a local practitioner who saw the deceased after the first accident was of the opinion that she ought not to be moved. Representatives of the Order of St. John and the British Red Cross Society have expressed to the committee the same general views and advice that the patient should not be moved until first aid has been given appears in the textbooks of both bodies. It is added that the number of street accident cases dealt with by the Council's ambulance service in 1930 was 34,529, that this method has been employed ever since the ambulance service was started, and that the case under review is the first of its kind which has occurred. Notwithstanding the opinion of the judge and jury, and of Sir William Willcox as expert witness, it is proposed to keep to the established practice, which is in accord with up-to-date medical opinion and the advice of the Council's own officers; it is considered that it would be highly dangerous to issue an instruction to the ambulance staff that injured persons are not to be treated where they fall.—*Brit. M. J.* Feb. 1931, 1: 292.

Impairment of Sight due to Small-pox: A Charge of Negligence

The following case was taken to court recently in Alberta. A workman who has a permanent impairment of sight, due to an attack of small-pox contracted at a lumber camp, sued the lumber company for damages. He claimed that the physician appointed by the defendant company in charge of the camp did not make a proper diagnosis of the original disease, and that his failure to do so was the direct cause of his impaired vision.

The case was tried before one of the local judges, who held that the camp physician was guilty of gross negligence, in his failure to diagnose the disease. He should have known that it was small-pox, since the plaintiff contracted it in the camp where the disease was prevalent. An ulceration formed on the plaintiff's cornea, resulting in a scar which permanently impaired the vision in this eye. The lumber company conducted an investigation through the camp physician and was held to be responsible by the court for the damage to the plaintiff.

The defendant company appealed the case, and, with the aid of expert witnesses, showed that the disease was of an unusual type, and as such was difficult to diagnose. It was further demonstrated that the company contracted with a properly qualified physician to furnish medical services to its employees, payment therefore being provided by periodical deductions from their wages. The Court of Appeal, in giving judgment in favour of the company with costs, and thus reversing the trial judge's decision, stated that the early cases were not typical of small-pox and that the strictures made upon the conduct and ability of the camp doctor, who

was a properly qualified man, by the trial judge, did not appear to have been merited, as it did not appear that he neglected the man, and it was very easy after a typical case had appeared to work back and conclude that all the other cases were small-pox. It was held that the company was not liable, even had the doctor been negligent, which was not the case, as found by the Court of Appeal. Therefore the company's appeal was allowed with costs and the action against it was dismissed with costs.

Abstracts from Current Literature

MEDICINE

The Incidence and Situation of Myocardial Infarctions in 1,000 Consecutive Post-Mortem Examinations. Barnes, A. R. and Ball, R. G., *Proc. Staff Mayo Cl.*, 1930, 5: 367.

Barnes and Ball have made a study of 1,000 consecutive post-mortems to determine the incidence and site of myocardial infarction. More or less localized infarction was recognized in 49 cases, or 4.9 per cent; 685 of the subjects were forty years of age or over and in this group the incidence was 6.86 per cent. The majority of cases had an associated hypertension. Gross myocardial infarction resulting from coronary occlusion was found to be almost completely confined to the left ventricle and was observed almost as frequently in the posterior basal portion of the left ventricle as it was in the apex and anterior portion. Notable preponderance of arteriosclerosis in the left coronary artery over that in the right was not found. The authors point out the danger of using epigrams in medicine. The anterior descending branch of the left coronary artery has been known in the past as the artery of sudden death. The fallacy of this has been clearly shown in this series of autopsy studies.

W. H. HATFIELD

Hypertension and Renal Disease. De Wesselaw, O. L. V., *Post. Grad. Med. J.*, 1930, 6: 31.

De Wesselaw in this article discusses two types of hypertension, namely the transitory type seen in acute glomerulonephritis and eclampsia, and the permanent type of essential hypertension. It is assumed that both these forms result from an increase in the causation of essential hypertension. Three main theories of hypertension have been brought forward, namely, renal, arteriosclerotic, and vasoconstrictive. It is concluded that the vascular change is widespread and that both media and intima are involved, the medial changes being due to hypertrophy and that in early essential hypertension there is a generalized arteriole spasm.

Recent investigation has been directed toward a search for a toxic body as the cause of this spasm. Quinidin, adrenalin and cholesterol have been incriminated by various authors. Allen believed that sodium chloride has some effect and Rylin stresses the calcium potassium ratio. De Wesselaw concludes that the search for a pressor substance as the cause of hypertension must be admitted to have been unsuccessful.

The transitory hypertension of acute glomerulo-nephritis is regarded as primarily a vascular disturbance in which evidence of a renal lesion appears late or not at all. The author believes that all the present causative theories of hypertension are still inadequate, but points out that opinion is shifting more and more away from the kidney.

W. H. HATFIELD

Calcium and Parathyroid Therapy in Chronic Ulcerative Colitis. Haskell, B., and Cantarow, A., *Am. J. M. Sci.*, 1931, 181: 180.

The authors have treated successfully 11 of a series of 13 cases of chronic ulcerative colitis with calcium salts by mouth and parathyroid extract intramuscularly. The patients became clinically well in from four to eight weeks after beginning the treatment and remained in good health over a period of from one to two and a half years. In the two remaining cases of the series symptoms recurred for short periods.

With regard to the details of treatment, the diet was cellulose-free, and of a non-irritating type. Belladonna in maximum doses and kaolin were also given. Calcium in the form of lactate thirty grains, or the gluconate, sixty grains, was given thrice daily. The time of administration was three to four hours after meals, as at this time the intestinal alkalinity is lowest and calcium is most readily absorbed. Ammonium chloride in twenty to thirty grain doses was also administered with the calcium in order to increase the availability or utilization of the tissue calcium. The parathyroid extract (parathormone) was injected intramuscularly at intervals of from 48 to 72 hours, depending upon the severity of the symptoms. Twenty to thirty units was the average adult dose. The rationale of this form of therapy rests upon the effect of these substances in controlling hæmorrhage and muscle spasm. The calcium also exerts a favourable effect upon the disturbance of nutrition in the affected bowel. The authors present experimental and clinical evidence to show that this nutritional disturbance is characterized by an alteration in calcium distribution, abnormal capillary and cell permeability, autonomic imbalance, and altered vasomotor tone. A brief summary of the clinical course of the thirteen patients subjected to this treatment is included.

E. S. MILLS

The Involvement of the Coronary Arteries in Acute Rheumatic Fever. Slater, S. R., *Am. J. M. Sci.*, 1931, 181: 203.

Slater presents clinical and electrocardiographic evidence of coronary arteritis with occlusion of one of these vessels in three cases of acute rheumatic fever. The cases were young adults of 36, 39 and 36 years respectively, without a previous history of rheumatism. The coronary closure occurred in each instance during a very active phase of the infection and was characterized clinically by the usual picture of agonizing pain, fever, leucocytosis and pericardial friction. All three cases gave a history of frequent epistaxes from the beginning of the rheumatic infection which the author considers as evidence of involvement of the veins. None of the patients died. On the contrary, all made a good recovery, though one subsequently suffered from angina pectoris. The author feels that these cases represent instances of an unusually extensive involvement of the vascular system by the rheumatic virus. This is further suggested by the frequent epistaxes. As to the exact nature of the coronary closure, he feels that there may not always be actual thrombosis, but that at times there may occur functional closure due to inflammatory œdema in or about the vessel wall. The suggestion is made that involvement of the coronary vessels is much more common in acute rheumatic fever than is ordinarily believed, but that it is not evident clinically unless actual closure occurs.

E. S. MILLS

SURGERY

Blue-domed Cysts and Cancer of the Breast. McGlannon, A., *Arch. Surg.*, 1930, 21: 912.

Many theories have been advanced to explain the origin and development of cysts of the breast. Cheatle's observations on the relation of cysts to the epithelium of the ducts are referred to. The two varieties of cysts are distinguished by the character of the cyst wall. In the first, the wall is lined by one or more layers of epithelial cells, and may or may not show papillary ingrowths. In the second type the epithelial lining is absent or fragmentary and degenerative. The gross appearances of the first variety show small multiple tumours containing clear, cloudy or milky or bloody fluid. These cysts are due to epithelial proliferation in the ducts. The cysts of the second type, are large single tumours and the gross appearance shows them as blue smooth rounded masses, hence the name "blue-domed cysts". Papillomatous cysts contain bloody fluid or grumous material, and, according to Cheatle, they are always multiple in the breast. These tumours may develop malignancy. On the other hand

the smooth-walled epithelial-lined cyst is usually non-malignant, yet it has been found that any sized cyst may contain papillomata and primary carcinoma. Since the blue-domed cyst is benign and so seldom associated with carcinoma, very conservative methods of treatment have been advised. Clinically the signs of this form are fairly distinctive. The tumour is spherical, often fluctuates, and is not fixed in the tissues. The surrounding breast is lumpy and rarely are there dilated ducts beneath the nipple. On transillumination there is a clear area in the position of the tumour. The tumour may be painful or tender and the mass may vary in size from time to time. Rarely the cyst wall may contain an area of active epithelium which is potentially malignant.

In Bloodgood's series of cases of blue-domed cyst cancer was present in 1 per cent of his 500 cases. In McGlannon's series of 100 cases of cancer of the breast there were three in which cancer and blue-domed cyst were present at the same time. He suggests that it is better to excise all blue-domed cysts and that the surrounding breast tissue as well as the wall of the cyst be studied for evidence of malignancy. When there is recurrence of blue-domed cysts repeated removal may become necessary, therefore removal of the breast should be advised. These patients are usually at the menopause, so that removal of one or both breasts will not cause much disfigurement. McGlannon reports two cases, in the first there was a scirrhus carcinoma of the breast and blue-domed cysts; in the second case there were blue-domed cysts and a malignant papillomatous cyst.

G. E. LEARMONTH

Treatment of Cancer of the Breast. Martindale, L., *The Lancet*, 1931, 1: 229.

Miss Martindale gives a comprehensive study of a series of 150 consecutive cases with an operative mortality of 1 per cent. The article is accompanied by several very complicated tables showing the results of her treatment with and without radium or x-ray therapy, in cases where there was or was not axillary involvement which did not have pre- and post-operative radiation, and which may or may not have had a complete operation.

Of the 150 cases 120 had post-operative x-ray or radium therapy, 21 received only surgical treatment, and 9 radiotherapy only. The surgical treatment was along the line of Halsted's technique. The author prefers one pre-operative x-ray treatment 14 days before, and post-operative prophylactic treatment starting from two to four weeks after the operation.

Miss Martindale is a firm believer in pre-operative radiation. Of five cases which had only deep x-ray therapy two lived three years, one lived four years, and one lived five years,

the fifth being lost sight of. She gives a complete description of her radiological technique. She considers the question of the influence of ovarian function as it effects the growth of mammary cancer. She does not advise an oöphorectomy or the production of an artificial menopause by x-ray.

In her conclusion she supports the establishment of cancer clinics and the competent examination of all women of over thirty-five years of age at least every six months. To really appreciate the results which Miss Martindale obtains one would have to make a detailed study of each case as listed in her tables.

W. L. GRAHAM

Concealed Carcinoma of the Tongue. McFee, W. F., *Ann. Surg.*, 1931, 93: 481.

Two types of carcinoma of the tongue occur which may be called "concealed". One is the classical type, but it escapes detection because of its situation, *e.g.*, when it is far back on the pharyngeal portion; the second is missed because it develops in the substance of the tongue. A series of 70 cases contained 14 which could be classed as concealed. The second type occurs usually in the posterior two-thirds, and on the inferior surface. Occasionally, a small ulcer is present; if not, then a dimple is noted over the growth. A large portion of the tongue may be involved before anything untoward is noted. Pain is usually not an early symptom. Digital examination of the tongue is the most reliable method of detecting these growths. The tongue must be released, *i.e.*, not thrust out. Examination of the posterior portion with a laryngeal mirror is also valuable.

Pain in or about the ear may be an early sign in growths situated in the posterior half. Awkwardness of the tongue may be complained of. Occasionally odd sensations are noted locally.

STUART D. GORDON

Fractures of the Skull in Childhood. Morrison, J. T., and Roskin, M., *Brit. M. J.*, 1931, 1: 212.

Fifty-seven cases of fractured skull occurring in children are discussed. The survey covers a period of two years. Adult cases admitted to a neighbouring hospital, having twice as many beds, numbered only 25 during the same period. The youngest patient in the series was one month old. No obstetrical fractures were included. Fractures of the base occurred in 22 patients. Radiography reported only 16 of these as positive. The fractures were the result of various, occasionally slight, injuries; 24 were the result of motor accidents.

Three cardinal symptoms are described, *viz.*, vomiting, impairment of consciousness, and bleeding from mouth, nose or ears. Occasional-

ly, cerebrospinal fluid was noted escaping. Three-quarters of the cases vomited; impairment of consciousness was noted in 66 per cent, and of these bleeding was seen in 71 per cent. Impairment of consciousness was noted in 112 cases admitted; of these only one-third proved to have fractures. Local signs, such as bruising, hæmatomata, depression, or tenderness are of value in determining the diagnosis. The mortality in these 57 cases was 18 per cent. Cases of basal fractures resulted in a mortality percentage of 32. Death resulted from irremediable brain damage in 6; meningitis, 3; and brain damage plus sepsis, 1. A pneumococcus was recovered on spinal puncture in the cases of meningitis. The late formation of an intracranial abscess was not found.

All cases of head injury should be regarded as possible fractures. The treatment consisted in keeping the patient recumbent for ten days, with mental and physical rest for another week. An open wound should be dealt with after treatment of the initial shock. A local anæsthetic should be used. Any depression is elevated. Loose fragments may be preserved. The head of the bed was elevated in all cases. Patients with signs of increasing intracranial pressure are given rectal injections of 10 per cent salt solution. Lumbar puncture is done if no result is obtained from the salt, and is repeated at intervals if necessary.

Thirty-three of these cases were followed and of these 13 suffered from headache, 4 showed increased nervousness, 1 was "very excitable", and 1 was said to be less intelligent; 2 children having unilateral facial paralysis following the accident recovered, in 2 and 9 months respectively. Some deafness occurred in 2 cases. None of these cases developed epilepsy.

STUART D. GORDON

Skeletal Metastases from Carcinoma of the Rectum. Aufses, A. H., *Arch. Surg.*, 1930, 21: 916.

The most common producers of secondary growths in bone are carcinomata of the prostate, breast, thyroid and pulmonary bronchus.

Bone metastases occur in about 7 to 10 per cent of carcinomata of the rectum. At the Montefiore Hospital, New York, skeletal metastases were found in 8 of 117 cases diagnosed as carcinoma of the rectum. Of these 78 died in the hospital and there were 29 autopsies.

The author reviews the cases quoted in the literature from 1870, when Curling reported the first case history of a patient with rectal carcinoma, with bone metastases in the posterior wall of the pelvis and in the upper part of the right radius. The number of cases reported in the literature from this date to the present is 16. Aufses outlines the histories of 8 patients with the post-mortem findings in 6 of these

cases. Skeletal metastases were proved in 5. Autopsy was performed in another, but the site of the metastases could not be investigated. X-ray observations in the 3 cases not proved by autopsy were sufficiently typical to make a positive diagnosis. A clinical diagnosis was made in 6 cases; the secondary growths were not discovered until after death in the remaining 2 cases. The disease was of long duration in practically all of the 8 cases and in most of those reported in the literature.

According to Von Recklinghausen, bone metastases are caused by the periaxial stagnation of the neoplastic cells as they pass from the blood vessels outside of the bony structure, into the vascular bed situated within the bone. Statistics show the order of frequency of the bones involved to be the vertebræ, femur, and pelvis, ribs and sternum, humerus, skull, tibia, radius and ulna. Irradiation offers some relief from pain in these skeletal metastases.

G. E. LEARMONTH

OBSTETRICS AND GYNÆCOLOGY

Accidental Hæmorrhage — Ablatio Placentæ. Polak, J. O., *Am. J. Obst. & Gyn.*, 1931, 21: 218.

Ablatio, partial or complete separation, of the normally situated placenta occurs as a comparatively frequent accident in the last weeks of pregnancy and in the course of labour. In 4,878 consecutive labours Polak found that ablatio occurred 16 times, an incidence of 1 in 305. It accounts for a fair proportion of intrapartal fetal deaths. Ablatio placentæ may be apparent or concealed. Even in the apparent type the hæmorrhage is primarily concealed. The predisposing causes are toxæmia, torsion and endometrial disease. Torsion with consequent engorgement of the uterine tissues is a factor in the etiology of both abortion and premature separation. Its effects may be minimized by having patients assume the knee-chest position for ten minutes three times a day throughout pregnancy. Exciting causes are direct trauma, violent muscular effort, and the use of pituitary extract in the first or second stages of labour.

Usually the first symptom is sudden and severe abdominal pain in the region of the uterus. Blood may escape or be retained, causing the uterus to become board-like, ligneous, and exquisitely sensitive to touch. Some degree of shock always exists. The signs of hæmorrhage are always progressive. The persistent escape of blood serum by the vagina indicates the presence of clots retained within the uterus. In slight detachment of the placenta during labour the fetal heart may not be disturbed, but as the separation increases the heart tones

become feeble, irregular or absent. Ablatio must be differentiated from placenta prævia, uterine rupture and premature labour.

Prognosis in ablatio is always serious, especially in the concealed variety. Maternal fatalities result from hæmorrhage, trauma, shock and sepsis and range from 2.6 per cent to 66 per cent. The fetal mortality varies from 60 to 95 per cent, chiefly from asphyxia due to interference with the uteroplacental circulation. Any operative procedure on a patient in shock or in the presence of pronounced anæmia is extremely hazardous.

Shock should be combated by morphine, heat and the intravenous injection of 50 c.c. of a 50 per cent gum-glucose solution. No operative procedure on a bleeding case should be undertaken before a blood transfusion. Local is preferable to general anæsthesia. Polak finds that the conservative plan of treatment gives most satisfactory results. This consists in rupture of the membranes, packing the vagina with soaked gauze, and applying an abdominal binder. If the presenting part is in the pelvis and there is no bony disproportion, 3 minim doses of pituitary extract are given at 20 minute intervals. The pulse, systolic pressure, hæmoglobin, and red cell count are watched by half-hourly readings. After delivery the placenta is quickly expressed and the uterus packed with iodoform gauze. When, however, the conservative plan fails to arrest bleeding, or the cervix offers obstruction to easy spontaneous delivery, rapid section followed by hysterectomy must be done without delay. A woman can stand the loss of enormous quantities of blood if there is no tissue trauma. It is anæsthesia and trauma that kill.

ROSS MITCHELL

The Etiology and Significance of Necrosis (Infarction) of the Placenta. Montgomery, T. L., *Am. J. Obst. & Gyn.*, 1931, 21: 157.

Necrosis of the placenta is a physiological phenomenon, and is found to some extent in every full-term placenta. The process is initiated by degeneration of the syncytium and deposits of fibrin in the intervillous space. It appears likely that during pregnancy ferments are formed by the maternal tissues as a protection against the invasive character of the chorionic epithelium and that these ferments, as constituents of the maternal blood, cause degeneration of the syncytium. The successive stages in the progress of necrosis of the placenta are "focal necrosis of the placental villi", "conglomerate necrosis of placental villi," and "conglomerate necrosis of placental villi with extensive intervillous thrombosis."

Long-standing areas of necrosis may undergo the following alterations: disintegration and absorption of red blood cells, altering the

colour of the lesion from red to white (common); disintegration and absorption of intervillous fibrin deposit, leaving pale, closely compacted, necrotic villi (not uncommon); autolysis and cyst formation in the centre of the necrotic tissue (infrequent); invasion with monocytes and beginning organization of tissue (rare).

Hæmatomata of the placenta are not of the same nature as the necrotic lesions of the placenta. They result from the rupture of decidual arterioles. They occur most commonly when pregnancy is complicated with chronic nephritis. Necrosis of the placenta is found no more frequently in toxæmia of pregnancy than in normal pregnancy. The term "necrosis" is preferred to "infarction", because the process begins with small areas of tissue death rather than with obstruction of circulation.

ROSS MITCHELL

The Technique and Results of Myomectomy. Bonney, V., *The Lancet*, 1931, 1: 171.

Mr. Bonney's introduction to his article is a convincing proof of its necessity. Myomectomy until a few years ago was considered applicable to those fibroids which had a stalk or were sessile and single. Mr. Bonney during the past 18 years has been developing his present technique and has performed myomectomy 403 times. The myomata were solitary in 166 cases, and multiple in 237 cases. The greatest number removed in one case was 125. He reports other cases with 92, 80 and 55 that he has removed with preservation of uterine function, and he has performed myomectomy in cases in which the total mass was about that of a full time pregnancy. The position of the tumour has more to do with the difficulty of the operation than the multiplicity. The mortality was 1.7 per cent. He has been able to follow 210 cases. Of these menorrhagia persisted or recurred in 10 cases, 5 of which subsequently underwent hysterectomy; 8 of 210 cases developed new fibroids after the operation; 2 required no further treatment and in the 6 who subsequently underwent a second abdominal operation their respective ages were 19, 23, 29, 30, 29 and 36 years.

Mr. Bonney believes that the nuclei of all fibroids that will develop in a woman are laid down by the time she is 30 years of age. In the case of the girl of 19 who had recurrent fibroids 92 were removed at the first operation. When fibroids are developed at such an early and unusual age a special tendency to the formation of such tumour must be inferred, and, therefore, the chance of new fibroids forming must be very considerable, not only because the patient has more years before her in which to form them but also because the uterine tissue itself is in its fibroid-forming

tendency peculiar. It is in these younger patients that the conservation of the uterus is most important. Of the 210 patients 120 were under 41 years of age. Of the 120, 33 have remained unmarried or widows, while in 10 cases pregnancy was prevented. Of the 77 married women within child-bearing age 39 per cent conceived.

The three previous objections to this operation were (1) except when the fibroids were few the operation was more serious than hysterectomy, (2) that the excessive loss at the periods would probably continue after the operation, and (3) that the uterus subsequently, if many fibroids had been present, would be of little use in child-bearing and would be a danger in the event of conception. The mortality rate of 1 or 2 per cent, the 3 per cent recurrence of menorrhagia, and the fact that 39 per cent of the patients in the child-bearing age may be expected to conceive have answered these doubts. Of the children born after myomectomy was performed, 75 per cent were born normally.

Mr. Bonney describes his technique in removing multiple myomas from different situations in the uterine wall. He has removed nine myomata from a pregnant uterus without abortion occurring. Of note are the special forceps that he uses in controlling the uterine vessels.

W. L. GRAHAM

PÆDIATRICS

Pericarditis with Effusion. Sutton, L. P., *Am. J. Dis. Child.*, 1931, 41: 78.

The author presents evidence to show that the striking physical signs in the lower part of the chest posteriorly are due to the distended pericardial sac of fluid coming into direct contact with the posterior chest wall. The heart does not materially change its position in the presence of an effusion into its sac, but rather maintains its position in relation to the anterior chest wall. The inflamed pericardial sac, however, by virtue of its newly acquired abnormal distensibility, as it becomes more and more filled with fluid, extends posteriorly below the hilus of the lung, pushing the lung upward and laterally, until the pericardium makes contact with the posterior chest wall. Thus there is an area of dullness to flatness on the left side of the chest (and sometimes to a smaller extent on the right side) from the angle of the scapula down. Over this area the voice and breath sounds are transmitted directly from the bronchus through the pericardial fluid to the chest wall. The author has always found an area of resonance between the dullness posteriorly and the left border of cardiac dullness,

clinically confirming the belief that the lung is pushed laterally.

The area of basal dullness in pericardial effusion is distinctive as compared to that in pleural effusion. In pericarditis with effusion it is always round or square, falling off sharply at its outer margin, while in pleurisy with effusion the upper limit of the signs is the Ellis line, lower at the spine than in the mid-scapular line, and sloping off gradually toward the axilla. The persistence of a pericardial rub does not exclude the presence of even a large effusion. The posterior site for thoracentesis, at the centre of the flattest area, nearer the spine than the axilla, is recommended.

A. K. GEDDES

Wheezing Respirations in Children: Bronchoscopic Observations on Stridorous and Asthmatic Breathing. Jackson, C., *Am. J. Dis. Child.*, 1931, 41: 153.

Wheezing, audible at the open mouth of a patient, means always some obstruction in the larger air-passages. "The character of this obstruction to the free noiseless passage of air can be determined in practically every case by tripartite conference of the pædiatrician, who can tap, look and listen on the outside, the roentgenologist, who can look through the patient, and the broncho-œsophagoscopist, who can look inside the patient." In the experience of the bronchoscopic clinic, a foreign body in the upper air passages or œsophagus is the most frequent cause, with tenacious bronchial secretion ranking second. Tracheo-bronchial adenopathy, pulmonary abscess, bronchiectasis, acute infective laryngo-tracheitis, papillomas of the larynx or trachea, and cicatricial processes in the bronchi are common causes, while more rarely compression from a large thymus or substernal goitre may be the etiological factor.

Jackson calls attention to the frequency with which wheezing is mistakenly ascribed to asthma in patients with foreign body, papilloma of the larynx, or other mechanical obstruction. "The diagnosis of asthma," he says, "should not be made until all other possible causes of wheezing have been excluded. All is not asthma that wheezes." Bronchoscopically, there is no evidence of spasm of the bronchi in asthma. It may be present in the peripheral bronchioles into which the bronchoscopist cannot see, but obstruction in the smaller bronchi does not cause wheezing audible at the open mouth. There is invariably in asthma a congestion of the bronchial mucosa and a thick tenacious bronchial secretion. This secretion is the cause of the wheeze and dyspnoea of asthma, and aspiration of the secretion causes the dyspnoea and the wheeze to disappear.

A. K. GEDDES

Incomplete Dilatation of Lungs as a Factor in Neo-Natal Mortality. Henderson, Y., *J. Am. M. Ass.*, 1931, 96: 495.

The largest class of neo-natal deaths is related to lung conditions, atelectasis, pneumonia, etc. Inhalations of carbon dioxide in oxygen would prevent most of these accidents. Especially in premature infants death arises from incomplete expansion followed by pneumonia. In a series of 800 autopsies, performed on neo-natal cases, as many as 68 per cent arose from this cause. Even in normal children the lungs frequently do not completely dilate for many hours and the routine inhalation suggested above would eliminate all danger of lung complications. This treatment would also guard against post-operative pneumonia which usually develops from atelectasis.

The author points out that carbon monoxide poisoning, post-operative pneumonia, and lung complications of the new-born are all related at one point—they all react favourably to inhalations of CO₂ in oxygen, for the reason that in proper percentage carbon dioxide stimulates the respiratory centre which requires more than the normal pressure of CO₂ in its decreased sensitivity. In cases of brain injury this same condition of the respiratory centre is present and will almost always respond enough to CO₂ inhalations to tide the patient over the danger period.

P. M. MACDONNELL

ORTHOPÆDICS

Low Back Pain. A Study of 525 Cases of Sacro-Iliac and Sacro-Lumbar Sprain. Miltner, L. J., and Lowendorf, C. S., *J. Bone & Joint Surg.*, 1931, 13: 16.

Any paper from Dr. Steindler's clinic is sure to be interesting, and this is no exception. Back pain may be referred from an overloaded colon, the kidneys and the uterus (though the question of how much the uterus contributes to backache is by no means settled. Cabot believes that there is no type of backache or reflex pain that can be definitely referred to pelvic disease). Meningeal and cord diseases and tumours cause backache, and lastly affections of the vertebral column itself. Low back sprains are to be considered exclusively, that is, pain of mechanical rather than inflammatory origin, severe injuries being excluded. It is noted that many cases originally diagnosed as sprains were sooner or later proved to be arthritic in origin. It is admitted that after a backache has lasted six months it is increasingly difficult to exclude arthritis. Cases of sacro-iliac and sacro-lumbar sprain, or combination of both are classified as (1) traumatic; (2) occupational; (3) postural; and (4) others, including that due to a short leg, a stiff hip or an artificial leg, to mechanical

instability of the foot, to toxic states with weakened musculature, gynæcological and obstetrical conditions, obesity with pendulous abdomen, and psychoneurosis.

Steindler differentiates sacro-iliac from sacro-lumbar sprain by (1) a definite point of tenderness over the posterior sacro-iliac ligament rather than over the posterior sacro-lumbar angle. (2) When seated a patient with sacro-iliac strain can bend forward freely; the sacro-lumbar cannot. When standing, both will show limited motion, due to the action of the hamstrings in fixing the pelvis. Straight leg raising and pressing the iliac crests together are valuable tests of sacro-iliac sprain, if present. Quite a few cases originally diagnosed as neurotic later turned out to be arthritic. X-ray findings are not of much value in diagnosing sprain or in differentiating between the two main types. Impinging transverse processes, sacralization and lumbarization suggest undue leverage and possible sprain. The approach of the sacrum towards the horizontal increases the shearing stress in the lower lumbar spine and lumbo-sacral junction. Deductions from actual measurements of the lumbo-sacral angle are likely to lead one into error. Asymmetry of the lateral articulations is common, so much so that one might almost say that variations are normal. Treatment is generally satisfactory. When there is much muscle spasm head and pelvic traction is beneficial. As the condition improves, baking, massage and exercises are indicated. If adhesive strapping seems insufficient, use a plaster spica, especially if pain radiates down a leg. In postural condition use a brace and physio-therapy and later exercises. A weak foot and a short leg need correction. Manipulation under an anæsthetic is good, especially in sciatic cases where recumbency and brace treatment have failed. Stretching the sciatic nerve gave permanent relief in 50 per cent of cases. In several persistent cases of sciatica the injection treatment with novocain and salt solution gave relief lasting only a few days. In chronic cases fusion of the affected joints is advised.

Fifty per cent of permanent relief in sciatica cases due to stretching (under an anæsthetic of course) is rather higher than one sees in clinics generally. Nothing was said about the flat back or reversed lumbar curve which in the reviewer's opinion is of sufficient importance to warrant its correction.

J. A. NUTTER

Conservative Treatment in Surgical Tuberculosis of the Lower Extremity. Rollier, A., *J. Bone & Joint Surg.*, 1930, 12: 733.

Dr. Rollier is the great apostle of helio-therapy and gives us his credo. It may be that the sunlight of Switzerland has powers beyond

our own, but, whatever the reason, his results have generally failed of duplication here. Dr. Russell Hibbs, of New York, stands at the antipodes in opposition to him, and maintains vehemently that short of fusion by operation or the disease itself joint tuberculosis is never thoroughly cured. We give the standpoint of each. On this continent Dr. Hibb's views are much more popular than are Dr. Rollier's.

Dr. Rollier begins by insisting that surgical tuberculosis is in all cases a local manifestation of a general disease, never a simple local illness alone. Consequently, both local and general treatment are needed. Since 1903 he has practised general heliotherapy, applied to the whole body, and giving to the patient both of the great healing agents, air and sunshine. The complete solar spectrum must be furnished to the entire area of the skin. The skin plays a rôle of capital importance. It is not only an organ of protection but one which regulates the peripheral circulation. It is also an organ of innervation upon which all the radiations act, as also an organ of elimination and secretion. Lastly, it is an organ of immunization and of internal secretion intimately associated with the endocrine glands. Heliotherapy is alone capable of bringing out the full value of the skin functions. Heliotherapy aids also in muscular regeneration and this in turn aids the general circulation. The bones in tuberculosis are particularly benefited by becoming recalcified, a process which also occurs in rickets. Dr. Rollier has long since abandoned operative interference in joint tuberculosis. A sequestrum is occasionally removed only when necrosed through secondary infection. Plaster jackets and spicas are banned and are termed the greatest physiological and orthopaedic mistakes of our times, causing the skin to cease to function and the muscles to atrophy. Rollier does not completely immobilize the affected joint, but puts on extension, maintaining that the joint cartilages will otherwise become destroyed and movement cease. He aims at the restoration of motion as part of the cure. He maintains that his hip cases heal almost always without ankylosis, and that the cures with movement show less tendency to recurrence than those with ankylosis. Tuberculosis of the ankle joint is, he says, above all the most favourably influenced by heliotherapy.

Diet should be rich in vitamins and in mineralising substances — cereals, vegetables and fruits. Keeping up of the patient's morale is also of the greatest importance.

Many convincing photographs and x-rays are appended. Rollier's cases seem mainly to be those of childhood tuberculosis, the joints in which are much more easily cured than the adult type. Even so, he makes claims not only for a finality of cure, but a cure with methods

which seems beyond our powers on this continent.

J. A. NUTTER

UROLOGY

Tumours of the Testis. MacKenzie, D. W., and Ratner, M., *Surg., Gyn. & Obst.*, 1931, 52: 336.

The authors, in a very extensive discussion, review the literature and the various theories of the origin and nature of these tumours. Apparently there are two generally accepted theories. One group, headed by Chevassut, believes that some growths of the testis are teratomata and others are true homologous tumours arising from adult spermatoblasts. The other theory, supported by Ewing, is that all tumours of the testis are teratomatous in nature. After the discussion the authors conclude that there are probably both types of new growth of the testis, but that the majority of them belong to the teratomatous group.

The pathology of these tumours is very interesting. They are divided into four classes. (1) *Embryonal carcinomata or embryonal teratomata* (in which one type of tissue predominates); the greatest number belong to this class. (2) *Teratoid or mixed tumours*. Here embryonal structures derived from the three germinal layers are easily discernible. (3) *Chorio-epithelioma*. (4) *A miscellaneous group*, including the dermoid fibroma, chondroma, myoma, adenoma and lymphosarcoma.

Malignant tumours of the testis metastasize readily and very early by way of the lymphatics and blood vessels. Metastases are apparently present long before they are discovered clinically.

Tumours of the testis are rare. Amongst 207,174 admissions to the Royal Victoria Hospital, Montreal, only 27 cases of tumour of the testis were found. Heredity does not seem to play any part in the disease. The right testis is more often involved than the left one. Bilateral malignant growths and growths of undescended testes are extremely rare. Trauma probably plays a part in the etiology, that is, between the 20th and 50th years. The youngest patient seen by the authors was 21 years of age.

The symptoms usually complained of are swelling and pain in one or other side of the scrotum. This is at times associated with a mass in either groin. Advanced cases will also have dyspnoea, cough and oedema of one or both legs. The diagnosis is made by a process of exclusion. Tuberculosis, syphilis, hydrocele and hæmatocele must be considered. The best treatment is operation, supplemented by deep x-ray therapy.

The prognosis is always poor. Metastases apparently occur very early and are present in many cases in which clinically they are not

demonstrable. Of the 13 cases reported by the authors, 3 were inoperable and were dead within one month after admission to the hospital. Two cases are alive and well, 5 years and 4 months, and 4 years and 11 months, respectively, after operation. Two cases are living but with metastases. Five cases are dead. One case cannot be traced. The results reported by Dean are also given and appear to be very promising.

N. E. BERRY

NEUROLOGY AND PSYCHIATRY

The Clinical Syndrome of the Corpus Callosum.

Alpers, B. J., and Grant, F. C., *Arch. Neurol. & Psych.*, 1931, 25: 67.

Tumours of the corpus callosum give rise to clinical syndromes which are at times clear and at other times more or less obscure. After a review of the literature and analysis of their cases, the authors make an attempt to establish a well defined syndrome characteristic of involvement of this portion of the brain. Others have attempted the same task, but their formulations have frequently lacked in clearness and certainty. In all cases, mental symptoms are mentioned as prominent, and, in fact, generally overshadow other evidences. Wandering attention, inability to follow too complicated thoughts, and slow cerebration, with the consequent impression of stupidity, are the most likely disturbances in this field and are frequently coupled with memory loss and personality change in the direction of development of irritability or indifference. Equally important, but often not so striking, are the motor signs consisting of weakness in all four limbs, generally more pronounced on one side than the other. The face frequently escapes involvement. The third component in the picture is apraxia. This is of great importance when present, but unfortunately is often lacking. A combination of apraxia, hemiparesis and the mental signs mentioned should leave no doubt as to the diagnosis.

A. T. MATHERS

Radium in Intracranial Tumours.

Sargent, P., and Cade, S., *Brit. J. Surg.*, 1931, 18: 501.

The authors report their experience in 21 cases of intracranial tumours treated by radium. They point out that, *a priori* gliomata should be the most favourable for radium treatment, and give an instance early in their paper of a case in which after such treatment there was not only apparent cure, but some restitution of function. Preliminary decompression is essential and is to be followed by a two-stage treatment combining interstitial irradiation with surface treatment whenever possible, and employing high voltage x-ray therapy when surface therapy is not practicable. For interstitial radiation they prefer seeds to

needles, but point out that such treatment is not well tolerated in lesions below the tentorium. Headache, persistent hiccough, polyuria, and escape of cerebrospinal fluid are the chief unpleasant sequelæ. For surface radiation a special rubber cap with needles implanted is employed until all the hair is shed and in some cases until peeling of the scalp results. Papillædema increases and retinal hæmorrhages occur, but both subside in a few days.

They conclude that whilst some cases are completely radioresistant, others, and particularly astrocytoma and medulloblastoma, respond rapidly; spongioblastomata respond irregularly, but with post-operative surface radiation complete regression was obtained in a few cases. Repetition of treatment and combination with deep x-ray therapy may have to be considered. Incidentally, they note the effect of irradiation in apparently diminishing the functional activity of the choroid plexus and feel that this deserves further study.

A. T. MATHERS

The Etiology of Disseminated Sclerosis. Editorial. *The Lancet*, 1931, 1: 139.

Attention is drawn to the findings of Purves-Stewart, Chevassut, *et al.*, on the relationship of a filterable virus, *Spherula insularis*, to this disease. Carmichael and others have reviewed and attempted to substantiate these claims. The dispute over the colloidal gold and levulose tolerance tests, being considered irrelevant, is not detailed. In the matter of reaction of culture media, the methods pursued by Carmichael and Chevassut were not identical, and the failure in agreement in results was explained by Sir James Purves-Stewart as due to this discrepancy. It is unfortunate that identical methods were not followed. In the matter of the recovery of *Spherula insularis* in the cultures of spinal fluid from cases of the disease, the results of the two groups are completely at variance and it is considered highly important that Miss Chevassut should repeat her work in a neutral laboratory. Her failure to find virus in the fluid of fourteen unlabelled specimens from cases of disseminated sclerosis and her finding it in one case that turned out to be chorea make the need just that much more urgent. Dissatisfaction is expressed that the fundamental problems are still unsolved, three years after treatment with vaccines of *Spherula insularis* had been begun, and ten months after the discovery of the organism was announced. It is felt that the case is still unproved and that failure to court refutation, by putting all their resources at the disposal of their critics, calls for explanations from the protagonists.

A. T. MATHERS

Mental States in Chronic Encephalitis. Bromberg, W., *Psych. Quart.*, 1930, 4: 537.

From 1920 to 1930, 135 cases of chronic encephalitis were studied in the Manhattan State Hospital. Seventy-one cases were studied by the writer and the remainder from case reports.

The cases were classified according to the dominant psychiatric picture. This may vary from time to time in the same case. Anomalies of behaviour, seemingly caused by a more or less complete change of personality, were common in children. Generally the behaviour is in a setting of general "continued incorrigibility" with an element of compulsion in it. Aberrations of the sexual instinct are very common, normal inhibition being lost. The impression of intellectual enfeeblement which cases of chronic cases of encephalitis give is found to be based on dullness of expression rather than on actual defect of intelligence. But children who have developed acute encephalitis at an early age may show arrest of intellectual development.

Among the affective states observed depression was found to be most common. The patient is depressed "reactively", i.e., in realization of his present condition in contrast to his previous health; or the depression may resemble the manic-depressive type, in which case the pre-existence of this tendency must be borne in mind. The poverty of volitional movements of the facial muscles and their fixity may give the impression of emotional dullness, apathy, and lack of interest in the environment, when such is really not the case; but in some cases it is known that emotional indifference is present.

Among the 135 cases examined 9 presented mental states superficially resembling schizophrenia, i.e., with delusions, hallucinations and ideas of reference. But the fundamental symptoms, as described by Bleuler, namely affective inadequacy, dissociation of thought, and autism are absent. Paranoid hallucinatory states are frequent. The following case is an example. An intelligent Hungarian farmer contracted acute epidemic encephalitis in 1920. Two years later the Parkinsonian syndrome appeared, with narcoleptic symptoms. In 1929 while in a hospital for chronic diseases he developed persecutory ideas. He stated that people called him bad names and wanted to poison him. After several months the paranoid ideas gradually faded.

Isolated acts have been noted which must be distinguished from those seen in the behaviour problem cases in which the impulses occur in a setting of general incorrigibility. Paroxysmal dipsomania and kleptomania are considered isolated impulsive acts. Impulsive murder has occurred.

A neurasthenic group is described in which the prominent symptoms are headache, dizziness,

paraesthesias, palpitation and vaso-motor symptoms; also a psychasthenic group with distractibility, indifference, compulsions and phobias.

A. G. MORPHY

The Diagnostic Value of Sensory Auræ in Epilepsy. MacCurdy, J. T., *Brit. J. Med. Psych.*, 1930, 10: 34.

Epilepsy is a disease which affects a sub-normal or abnormal organism. A disease may be physical in its ultimate basis and betray itself only in mental symptoms. In order to investigate the influence of mental factors in determining or augmenting special symptoms in epilepsy MacCurdy studied groups of cases in mental hospitals. It occurred to him that in epilepsy the crises (loss of consciousness and instability of muscles) might be caused by auræ not essentially an epileptic phenomenon but really a psychoneurotic or psychotic phenomenon. According to this view, the instability would be determined organically and the crises occasioned by superimposed stresses either physical or mental in origin. With this idea in view a large number of patients were investigated, at first the so-called idiopathic cases. In no case was a pure motor aura found. Cases reported as having motor auræ were found to have a "sensation" in an extremity or in the face followed by a muscular movement that seemed to be a reaction to the situation. In no case was the movement primary.

From his investigations the writer deduces that the idiopathic aura is sensory or psychic. He found that every (sensory) aura is accompanied by an emotional reaction, always painful, one of fear. There are also auræ leading from sensations to mental states with hallucinations and delusions. These, he says, are governed by the same psychological laws as the symptoms of hysteria, obsessions, etc. In certain cases the attack consists of an aura which does not lead into a fit. This may be considered a psychoneurotic symptom.

The above characteristics can be demonstrated in non-deteriorated patients if sufficient care be taken. The patient with a definite aura, provided it last long enough, will make some effort to distract his attention from it by change of occupation or a stereotyped action or thought. When this effort fails consciousness is lost. As mental deterioration comes on there is less effort to overcome the aura and attacks become more frequent.

He draws attention to the necessity of discriminating between sensory auræ localized to the arm, hand, or leg and those of true Jacksonian epilepsy. In the latter the patient's attitude toward the aura is objective rather than subjective, there is little or no emotional reaction, distraction has no effect, and attention to the part moving tends to abort the

attacks. Then effort is directed against the motor rather than the sensory components of the warning.

It must be borne in mind that a combination of Jacksonian and idiopathic types may occur. The following is an example. A patient had his brain injured by trauma, was unconscious one and a half hours and stupid for three months. A fright was followed by a grand mal seizure, and this by status. After this he had three or four attacks per week, each preceded by an aura of cramp in the left arm with numbness which would pass into the left leg. He would retain consciousness in this stage. He was operated on in the right parietal region, and afterwards had two or three attacks a year like the beginning of the previous attacks, but with the addition of fright and the feeling that if he could distract himself he could work the attack off. For two years he deteriorated, and then learned photography, which mental stimulus awakened his interest in life, and with it his deterioration disappeared and his seizures ceased. MacCurdy's view of the case is that while the Jacksonian epilepsy was cured by operation the central disturbances continued as a neurosis. The neurosis was cured by a new interest and then epilepsy itself disappeared.

MacCurdy does not believe that the use of the terms "neurotic" or "psychotic" in describing the aura explains epilepsy, but that the epilepsy, if severe enough, forces the patient to manufacture an aura, and that it would be useless to attempt to cure epilepsy by simply attacking one symptom, the aura; and that therapy is more rationally employed in establishing mental health by removing stress, internal or external, that leads to any sort of crises in the patient's life.

A. G. MORPHY

HYGIENE AND PUBLIC HEALTH

The Incidence of Illness Among Wage Earning Adults. Brundage, D. K., *J. Indus. Hyg.*, 1930, 12: 338.

For some years the Division of Industrial Hygiene of the United States Public Health Service has collected morbidity data from a number of industrial concerns scattered throughout the central and eastern parts of the United States. The information which has been published constitutes the best data we have on this continent on the morbidity of industrial workers. Indeed, so scanty are morbidity statistics that one has to rely almost entirely on these industrial figures to obtain an idea of the effect of sickness on the general population. Mortality statistics convey no adequate idea of the extent of sickness, for it is very evident that the diseases which afflict us most commonly and are

actually the most troublesome are not themselves the killing diseases.

In the present report Brundage has made a comprehensive survey of the data accumulated by his office. He has given information of the influence of sex, age, season and other variables which corroborates that already known, and he has added some entirely new data which are of considerable interest. The influence of the payment of *disability benefits* on absenteeism is shown in a study of the records of two companies, one of which pays wages during disability and the other does not. Both these companies are situated in the metropolitan area of Boston. The incidence of absences in the company which pays is much greater than in the company which does not. That unnecessary absence occurs in the former company does not appear certain, since practically every case is certified by the company physician. It is well known that many individuals are unwilling to stop work if they are to lose their pay, even if they are quite sick, and it can hardly be doubted that this tendency to continue when actually ill promotes the spread of communicable diseases, particularly colds and influenza, and definitely prolongs more serious diseases, notably tuberculosis.

Age is usually found to exert some influence on the occurrence of sickness. In general, older employees are absent less frequently than younger, but when they are absent they tend to stay away longer. Sex, of course, affects the morbidity picture profoundly. Female employees are absent as a rule much oftener than male employees. The incidence of disease is apt to be 50 per cent higher among females. Parenthetically, it may be noted that mortality rates are somewhat lower for females, which fact tends to support the idea that a more solicitous care of oneself has an ultimate favourable result.

If specific diseases are tabulated it is seen that the respiratory diseases occupy the most prominent place. Nearly half the absences are usually due to the minor respiratory diseases (colds, influenza and the like). Diseases of the digestive system are next seen in the numerical order of importance. The epidemic and endemic diseases, towards which preventive medicine has directed its chief attack, represent less than 3 per cent of the total number of absences. Alcoholism as a cause of absence is a factor of slight importance in most industries, but of considerable importance in some. Exposure to unpleasant conditions of work appears to influence the consumption of alcohol. The English experience corroborates this observation. Alcohol, too, appears to have some effect on the incidence of the ordinary diseases, for those employees whose records show absences from alcoholism appear to suffer more from other diseases than do their more sober fellows.

So far as the effect of specific occupation on the morbidity rate is concerned, information is given of six occupations—gold mining, anthracite coal mining, granite cutting, cement manufacturing, general manufacturing and iron and steel manufacturing. In the dusty trades (the first four mentioned above) influenza and grippe show a much greater incidence, (more than double) than that of the less dusty trades. Tuberculosis is prominent in gold mining and granite cutting and pneumonia in granite cutting and iron and steel manufacturing. Evidence is given indicating that in the iron and steel trade exposure to wide variations of temperature is a factor in the high pneumonia incidence.

FRANK G. PEDLEY

The Relation of Temperature and Humidity to the Course of a *B. Enteriditis* Infection in White Mice. Kligler, I. J., and Olitski, L., *Am. J. Hyg.*, 1931, 13: 349.

Recent epidemiological studies of typhoid fever in Palestine have indicated the likelihood that seasonal variations in epidemicity of intestinal infections are due to seasonal variations in the resistance of the host. Disturbances in the physiological equilibrium, due to such climatic factors as temperature, humidity and radiation, singly or in combination, are offered in explanation of varying susceptibility to invasion and localization of the organisms which cause the infections. The authors describe a series of experiments, carried on at the Hebrew University, Jerusalem, for the purpose of testing this hypothesis.

Groups of white mice were infected with different doses of *B. enteriditis* and kept at various temperatures and humidities, and an endeavour was made to ascertain precisely the effect of these variations on the development and duration of the infection. The results indicate that such environmental factors as temperature and humidity have a profound influence on host resistance. There are three stages to an enteric infection: (1) the passage of the bacteria past the stomach-duodenal barrier; (2) the penetration of the intestinal walls into the glands and lymphatic system; (3) the localization and multiplication of the organisms and their extension. No difficulty was found in infecting animals kept at different temperatures, but the subsequent course of events was strikingly different. At the higher temperatures with low relative humidity the bacteria penetrate more rapidly but their development is held in check and the infection clears up rapidly. At both high and low temperatures with high relative humidities, the penetration into the glands is slower but the intensity and duration of the infection are greater. These results harmonize with the

nature and epidemiology of enteric infections observed at Jerusalem and support the assumption of a seasonal variation in host resistance due to environmental influences.

W. H. HATTIE

Contraception and the Medical Officer of Health. Millard, C. K., *J. State Med.*, 1931, 39: 46.

This is the second of a series of lectures recently delivered at the Royal Institute of Public Health under the general subject heading of "Contraception and Allied Questions". The first lecturer, an eminent divine, spoke in favour of properly regulated birth control. In the lecture under review Dr. Millard refers to the rapid change in attitude towards this question, contrasting the qualified approval given at the last Lambeth Conference of Anglican Bishops with the condemnation of previous Conferences. The Ministry of Health has issued a memorandum stating the view of the Government "that in cases where there are medical grounds for giving advice on contraceptive methods to married women in attendance at maternity and child welfare centres it may be given, but that it should be limited to cases where further pregnancy would be detrimental to health". Instruction in contraceptive methods is now being given to Edinburgh medical students, and birth control clinics have been established by several municipalities. So the feeling in favour of birth control "has made quite remarkable, indeed triumphant, progress". Dr. Millard cites conditions affecting women which make pregnancy dangerous to them, and argues that the health of offspring is equally worthy of consideration. The medical officer of health naturally thinks of means of preventing ill health. Millard believes that instruction in the methods of contraception would minimize the admitted evil of criminal abortion. Such instruction can best be given to those who most need it at properly organized birth control clinics, which may be most simply arranged as special sessions of existing ante-natal clinics. It is urged that family-limitation is now the rule among the well-to-do and that the effect thus far has been really dysgenic. "We have restricted breeding at the top, but not at the bottom." Steps cannot be retraced. The upper strata are unlikely to abandon birth control, so "our only hope is to press forward and to teach and encourage the lower strata to follow suit". When we have succeeded in this, birth-control, combined with sterilization, may become a valuable instrument of negative eugenics. But we must also encourage parenthood amongst those classes well fitted to be parents, who at present, in some cases, carry birth control too far. Sterilization is advocated, in a short paragraph, as the only form of contraception appropriate to the feeble

mind and mentally deficient; it is "100 per cent efficient, as well as being permanent".

Millard concludes: "Contraception is a subject which, especially in its practical aspects, closely concerns the medical profession. . . . In the past we, as a profession, have certainly neglected it, this being due no doubt to the supposed ethical objection. To-day the field is clear, and few fields of scientific research are of greater importance or offer better prospects of reward in the sense of acquiring fresh knowledge calculated to prove of lasting benefit to mankind."

W. H. HATTIE

Irradiation of School Children. Hill, L., and Laurie, A. R., *The Lancet*, 1931, 1: 182.

This paper is of unusual interest because it is evidently intended as a counter-blast to a report published by the Medical Research Council in 1929 which cast doubt on the usefulness of light treatment. In that report, Dr. Dora Colebrook discussed the results of her investigation of the effect of irradiation on the health and development of Willesden school children and concluded that the results were negative. The publication provoked much comment in the lay press and in some of the professional journals, and at least one of the latter was rather bitterly critical of the Medical Research Council for issuing a report which, it claimed, was not based upon properly conducted research. In the paper under review, Sir Leonard Hill and Dr. Laurie refer to the large number of authorities who have reported positive results, and indicate that Dr. Colebrook's negative results in the case of children living in good conditions and treated by short exposures to a powerful long-flamed arc led them to a study of children living under less favourable conditions and given light treatment with other intensities and times of exposure. Advantage was taken of the opportunity to test the validity of the claim that oral administration of vitamin D has the same effect as irradiation. Personal bias was eliminated so far as possible by securing the advice of statisticians in respect of the selection of groups of children. Physicians who examined the children conferred beforehand to evolve a uniform method of recording, and each child was examined at the end of the experiment by the same doctor who had made the examination before treatment was commenced. The children were divided into four groups, but the doctors were kept in ignorance of the groups to which the children belonged, and so could not be influenced in their findings by knowledge of the treatment. The children were divided into four groups. Those in the first group were radiated twice weekly (Dr. Colebrook had radiated thrice weekly),

the maximal dose being about one-tenth of the maximal dose used by Dr. Colebrook. Those in the second group were each given a radiostol pellet (equivalent in vitamin D content to about two ounces of good cod-liver oil) daily. Those in group three were given pellets of the same appearance, but which contained no vitamin D, and were exposed twice weekly to an arc fitted with a glass screen. (This was to demonstrate the psychic effect, if any, of taking pellets and undressing before a lamp). Group four received no treatment, being used as a control. The doctors noted results under twelve general headings. From the conclusions we excerpt the following: Marked improvements under any particular heading or class of headings are always shown in groups 1 and 2, by a really appreciable margin; group 1 always shows slightly better results than group 2; the cases which made really spectacular improvement were in group 1; the greatest effect on children seemed to be on their eating and sleeping; the improvement has been most marked, in the case of the ultra-violet ray treatment, in the very headings we should most expect it, and slight or absent in the gland group—where there are such underlying causes as diseased tonsils, bad teeth, and lice.

W. H. HATTIE

Value and Duration of Immunity Conferred by Antidiphtheritic Anatoxin. Ramon, G., and Debre, R., *et al*, *Am. J. Dis. Child.*, 1931, 41: 1.

Seven years after the introduction of his anatoxin (diphtheria toxoid), Ramon reports a study of the antitoxic content of the blood serum in 105 children and relates it to the number of injections given, to the age of the child, to the degree of contact with diphtheria, and to the degree of immunity conferred.

A negative Schick test shows only that the blood serum contains one-thirtieth of an Erlich unit of diphtheria antitoxin, this proportion of antitoxin being usually considered necessary and sufficient to protect man against a toxic injection of the specific bacillus. Titration of the antitoxic power of the serums of 105 vaccinated children showed an antitoxic content of more than one-thirtieth unit in 96.2 per cent, and of less than one-thirtieth unit in 3.8 per cent. In the former group the Schick test was negative, in the latter positive. In the experience of the authors a negative Schick test corresponds with a serum the antitoxic content of which is more than one-thirtieth unit. Granted that persons giving a negative Schick reaction are protected against diphtheria, it thus appears that anatoxin permits of the immunization of more than 96 per cent of children.

A group who received two injections only, in 1925, compared to a group who received three injections, in 1926, showed a slightly higher antitoxin content, which is attributed largely to the greater duration of the post-vaccinal period. A fourth injection given to the positive skin reactors in 1928 produced a negative Schick test and a high antitoxin content in the serum in all cases. Studying the influence of age on the result of vaccination, the authors showed that the older the child when vaccinated, the higher the resultant antitoxin content of the serum. This is explained by the higher incidence of negative Schick reactions and appreciably antitoxic serums, and by the greater opportunity for occult immunization in older children. (All subjects in this series were more than three years of age.) Forty-five per cent of the children were known to have been exposed to diphtheria. Comparisons of their serums with those of the group who had presumably not been exposed appeared to show that exposure did not modify the antitoxic power of the serum in children who had been vaccinated. The inherent difficulty in drawing conclusions in this aspect of the problem is recognized.

Analysis of the data to show the relation between the duration of the post-vaccinal period and the present antitoxin content of the serum showed that even after a four-year period, 2.5 per cent presented no protective immunity. An antitoxin content of more than one-tenth unit, indicative of high immunity, was found in 95 per cent of those with a post-vaccinal period of more than four years, 95 per cent with a post-vaccinal period of three years, 89 per cent with a post-vaccinal period of two years, and 82 per cent with a post-vaccinal period of one year. The authors conclude: "These figures show in the clearest manner possible that the antitoxin content of the serum does not diminish with time, and they constitute a weighty argument in favour of a fact of capital importance, namely, the persistence, without diminution, of the immunity obtained by the use of anatoxin in vaccination against diphtheria."

A. K. GEDDES

THERAPEUTICS

Deep X-Ray Treatment of Chronic Gonorrhoeal Infection in the Female. Henry, C. M., *Radiology*, 1931, 16: 47.

Acting under instructions from the Provincial Health Department of Saskatchewan, the author treated 6 cases of gonorrhoeal infection in the female pelvis. These cases had previously undergone long continued medical treatment with no improvement. One woman

had a double salpingectomy performed. In all six cases there was oedema of the cervix with purulent discharge containing diplococci. This work was undertaken on the basis of a report by Dr. Young, of British Columbia, that he had observed encouraging results in similar cases. The technique employed by Dr. Henry was as follows. Using two portals, one anterior and the other posterior, he administered the following dosage: F. S. D. 50 cm.; K. V. P. 200; filtration $\frac{3}{4}$ mm. cu. and 1 mm. al.; 5 M. A.; time 60 minutes for each portal. Treatments were given on alternate days.

The summary showed 6 cases treated, of an average age of twenty-one years. Negative smears were obtained within three months of treatment. One patient became pregnant within three months after treatment. Menstruation was restored after varying intervals up to one year. All patients showed marked general improvement in health.

A. STANLEY KIRKLAND

Addison's Disease. Experiences in Treatment.

Rowntree, L. G., *et al*, *J. Am. M. Ass.*, 1931, 96: 231.

The poor results in the treatment of this disease have made it clear that we cannot live without the suprarenal cortex and has led to intense search for a substitute, and some success has been obtained. Usually progressively fatal, the disease does at times show remissions which almost simulate recovery. Treatment includes rest, freedom from worry or strain, proper nourishment. Ten per cent dextrose in sodium chloride has been found most useful. In 1920 the Muirhead treatment, so-called because used in treating Dr. Muirhead himself for the disease, was instituted, which meant pushing epinephrine to the limit of tolerance, with administration of suprarenal substance or cortex by mouth. He improved remarkably, but lived less than a year. Fifty-seven more have been treated in this way. Thirty-two were improved; 25 were not helped at all.

Other products like epinephrine and preparations from the suprarenal gland have been tried. Ephedrine seems to have no effect. After many attempts Swingle and Pfiffner isolated a cortical hormone which kept alive dogs whose suprarenals had been removed. This has been used in 7 cases of Addison's disease, but to date the supply has been very limited. In every case there has been remarkable improvement, commencing within 48 hours and lasting varying lengths of time. Obviously, these cases will need cortical hormone at intervals all their lives. When, however, the hormone is available commercially the treatment of Addison's disease will have ceased to be a hopeless struggle.

P. M. MACDONNELL

Obituaries

Dr. Georges Berberi. In the death of Dr. Georges Berberi recently the profession has suffered a great loss. He died at the age of 31 years at Baie St. Paul from what seems to have been a paralytic stroke. He graduated in 1924 after which he served as interne at Laval Hospital, and then began to practise at Ste. Julie de Mégantic, his birth-place. Later on he undertook post-graduate studies in New York after which he settled in Baie St. Paul. He was greatly esteemed and had a great many different activities. At the University he enjoyed great popularity and was possessed of many artistic gifts in music and art. Frequently he was called on to draw caricatures of his various professors, which were greatly enjoyed. He began to work on a bust of his Eminence Cardinal Bégin, and obtained such success that the French sculptor, Vermare, offered him his congratulations on the work. Later on, however, the doctor gave up his rights to the bust and a friend completed the work. He leaves a wife and child.

Dr. John Paul DesRosiers died in Saskatoon on February 20, 1931. He had been in poor health since November. Death was due to coronary thrombosis.

Dr. DesRosiers was born forty-eight years ago in Montreal. He attended Laval University there and graduated in Arts and later in Medicine. From 1906 to 1908 he was an interne in Notre Dame Hospital, Montreal, and came to Saskatoon in 1908.

From 1908 to 1929 he was coroner for Saskatoon; for five years he was Catholic representative on the Board of Education for Saskatchewan; he was a member of the Sanatorium Board since its inception; he was active in the Knights of Columbus; a Kiwanian until recently; twice president of St. Paul's Hospital medical staff; physician to the Order of Eagles and to the nursing school of St. Paul's Hospital. Last July he was appointed consular agent for the French government in northern Saskatchewan.

Dr. DesRosiers was keenly interested in rugby and hockey; while an undergraduate he played in goal for the Montaguards, a Montreal senior amateur hockey team. He is survived by his widow and one daughter, Yvette.

Dr. Alexander Falkner. An old and highly respected resident of the County of Glengarry, Dr. Alexander Falkner, passed away at his home in Lancaster on February 20, 1931. He was in his ninetieth year. Dr. Falkner had lived quietly in Lancaster all his life, and was held high in the esteem and affection of the community which he served. He was a member of one of the oldest families in the district, the first Falkners to settle in Lancaster having been United Empire Loyalists. Dr. Falkner received his early education at home, and then went to McGill University to take his medical course. He graduated in 1866, and then returned to his birthplace, where he remained as a practising physician for the remainder of his days. He was predeceased by his wife a year ago last July, and one son, Flight-Lieut. Harold Falkner, was killed in the war. He is survived by two daughters: Mrs. A. F. Rogers, of Ottawa; Mrs. F. W. Downs, of Winnipeg; and four sons, Dr. A. D. Falkner, of Montreal, Major James Falkner, of Ogdensburg, N.Y., D. B. Falkner, of Peterborough, and S. H. Falkner, of Thorold.

Dr. Wilmot A. Graham. Following a brief illness from pneumonia the death occurred on March 8, 1931, at the Toronto General Hospital, of Wilmot A. Graham, M.D., L.R.C.S. (Edin.). At the time of his illness Dr. Graham was a resident of Weston. The son of Ex-Alderman R. H. Graham, he was born in Toronto in 1881, and had practically spent his life in the city.

Following his graduation from the University of Toronto (1903), Dr. Graham pursued post-graduate work in Edinburgh, Scotland. He had the distinction of being one of the first doctors to be appointed to medical inspection of the public schools of Toronto. For some time he had been retired from active practice because of ill health.

Surviving are his widow; his father; one sister, Mrs. Alex. Leitch; and three brothers, F. W. Graham, of the City Commissioner's Department, W. C. Graham, of Barrie, and H. A. Graham, of Toronto.

Dr. Allan Bernard Greenwood, of Niagara-on-the-Lake, died after a paralytic stroke on February 15, 1931. Dr. Greenwood graduated from the University of Toronto in 1894. He was a member of the Anglican Church, and leaves a widow and one son.

Dr. William George Jamieson, Cobourg, Ont., died on February 27, 1931. Dr. Jamieson was born in 1887, and graduated from the University of Toronto (1916). He served overseas with the C.A.M.C. and, after post-graduate work in Detroit, was associated in practice with Dr. J. Ivey for a few years.

Surviving are his widow, the daughter of J. D. Hayden, founder and executive head of Cobourg General Hospital, a two-year-old son, John Hayden; his parents, Mr. and Mrs. George Jamieson, Port Hope; four brothers and one sister.

Dr. Leo Langlois, of Prince Albert, Sask., died on December 3, 1930, after an operation. He was born in the St. John suburb of Quebec City 48 years ago, and received his early education at Levis College, graduating in medicine from Laval University in 1909. He first practised on the Island of Anticosti, when the island was owned by M. Meunier, the "Chocolate-king of France." He came west in 1912 and lived at Lebreton. The next year he moved to Marcelin where he practised until 1928, when he came to Prince Albert.

Dr. Langlois was interested in education and in politics. At one time he was chairman of the Marcelin school board. He was Past Grand Knight of the local council of the Knights of Columbus, was a member of the Société Franco-Canadienne and a director of *The Patriote*. He is survived by his widow.

Dr. Philip McRitchie, who died on January 28, 1931, after a short illness of pneumonia followed by meningitis, had just resigned his position as surgeon-specialist to the Maude Memorial Hospital, Basra, and was shortly leaving Iraq for England to take up an eye practice near London. Dr. McRitchie, whose home was at Kenora, Ontario, took his M.D. Manitoba in 1907; after further study in Edinburgh and at Charing Cross and University College Hospitals he took the conjoint qualification in 1913 and became house surgeon to Stroud General Hospital. At the outbreak of the war he entered the R.A.M.C., rising to the rank of captain and being awarded the Military Cross. From 1918-19 he was ophthalmic specialist to the British Expeditionary Force, and was then appointed ophthalmic surgeon to the Civil Hospital at Basra, changing over to general surgery when a vacancy occurred. He leaves a widow.

Dr. Thomas A. Morrison, surgeon to the Royal Canadian Mounted Police, died in Regina on February 26, 1931, after an illness of ten days following a cerebral hæmorrhage. He was born in June, 1869, at Lucknow, Ont., and went to school at Kincardine. In 1890 he came to Manitoba and taught school for a time. Later he entered the medical school of the University of Manitoba, from which he graduated in 1897. He then went to Holland, Manitoba, where he practised for five years; later, he went to Belmont, Manitoba, where he practised for another five years. In 1907 he moved to North Battleford and in 1908 he ran on the Conservative

ticket in the Federal election of that year. The years 1910 and 1911 Dr. Morrison spent travelling in Europe and in post-graduate courses at Berlin, Paris, London and Edinburgh. In November of 1911 he came to Regina. In 1916 he was appointed to the position which he held at the time of his death. In 1924 he was president of the Regina and District Medical Society.

Assistant Commissioner G. S. Worsley, officer commanding at the Regina Barracks of the R.C.M.P., expressed deep regret at the death of Dr. Morrison. "His kindness and courtesy had caused him to be highly thought of by all members of the force in Regina." He was a kind man; one of his typical acts was the procuring of mattresses from the federal authorities for prisoners confined at the Barracks. He said he saw no use in torturing men while they slept. His witty after-dinner speeches at medical banquets were a source of enjoyment to all the listeners.

A full military funeral took place from the R.C.M.P. chapel to the historic R.C.M.P. cemetery on the Barracks grounds, Regina.

Dr. Morrison is survived by his widow and one son and one daughter.

Dr. Robert Morrow, of Guelph, Ont., one of the best known skin specialists in the province, died at his home on March 9, 1931. A native of Peel County, Dr. Morrow had been in practice for the last 67 years, a record believed to be unique for the Dominion.

He was a graduate of Victoria University (1864) and practised in Acton before coming to Guelph in 1880. Surviving are his wife, one daughter, and two brothers, Hugh, of Brampton, and George, of Fergus.

Dr. William Ernest Procunier, of Corinth, Ont., died on January 3, 1931. He was a graduate of the University of Toronto (1905). Dr. Procunier formerly lived in Lamaline, Nfld. He is survived by his wife and two sons, George W., aged 6, and Edwin R., aged 3.

Dr. Robert Boyd Stewart, of Toronto, died on February 25, 1931. He was the son of the late Mr. and Mrs. Angus Stewart (Kinloss Township, Bruce County, Ont.), and was in his fifty-sixth year. He held the following degrees: B.A., Toronto, 1905; M.A., Toronto, 1906; B.Sc., Toronto, 1909; M.D., Johns Hopkins Hospital, 1917. He made one or two trips as medical officer on the Hudson Bay. He was doing research work and gained some success as a geologist. For some time he practised in Saskatoon. He was a brother of Dr. P. D. Stewart and the late Dr. H. A. Stewart, who also practised in Saskatoon.

Dr. Alfred Webb. The death took place on February 7, 1931, at the Toronto General Hospital of Dr. Alfred Webb, for many years an outstanding citizen of Newmarket, where he practised as a physician for over thirty-five years. He was in his sixty-fifth year and a native of King Township, the son of an early pioneer of that district. Dr. Webb graduated from the University of Toronto in 1895. Surviving are his widow, formerly Edith Davis, a daughter of Hon. E. J. Davis; and one daughter, Mary Margaret, at home.

Methinks that coarse men of bad habits and little power of reason do not deserve so fine an instrument or so great a variety of mechanism as those endowed with ideas and with great reasoning power, but merely a sack wherein their food is received, and from whence it passes away. For in truth one can only reckon them as a passage for food; since it does not seem to me that they have anything in common with the human race except speech and shape, and in all else they are far below the level of the beasts.—Leonardo da Vinci.

News Items

Great Britain

Surgical Research in the Empire.—The Council of the Royal College of Surgeons have accepted an offer from Mr. George Buckston Browne, F.R.C.S., to build and endow an Institution of Surgical Biological Research upon a 13-acre estate at Downe, near Farnborough, Kent, which he proposes to present to the College for this purpose. Mr. Buckston Browne states his belief, in a letter to its president, Lord Moynihan, that those who have added or are adding to the science and art of surgery are the greatest of all benefactors of the human race and the domesticated animal kingdom.

The estate concerned lies 16 miles from Charing Cross, adjoining the western side of Darwin's old home, "Downe House," which was presented, with its 23 acres of ground, to the British Association two years ago by the same benefactor. Mr. Buckston Browne has announced his willingness to endow the new estate with an initial sum of £50,000, and to add further gifts or legacies until his total benefaction to the research institution (including the cost of the land) reaches the amount of £100,000.

The ultimate size and design of the building to be erected, and the form of equipment, service, and staff are not laid down by Mr. Buckston Browne, but for the needs of the present laboratory workers, and of those surgeons who are now seeking an opportunity for testing inferences drawn from the clinical observation of certain diseases, he proposes the following initial provisions:—

(1) Three or four laboratories where investigations can be made under the best conditions, or where living animals can be closely observed and cared for; (2) houses for animals; (3) accommodation for a chief attendant, skilled in laboratory methods; (4) accommodation for a stockman, who will look after and feed the animals; (5) hostel accommodation for those who may wish to carry on continuous work in the institution.

The detailed work of examining results will be carried out in the laboratories recently attached to the College in Lincoln's Inn Fields, in connection with which four research scholarships have already been instituted. There is no need, therefore, to provide pathological laboratories at the Downe Institution; the direction of this is to be entrusted in the preliminary stages to Sir Arthur Keith, the Conservator of the Museum of the Royal College. The endowment is intended as the second stage in a scheme for making the College a centre of surgical research for the Empire as a whole.—*The Weekly Times*, Feb. 19, 1931.

The Prevalence of Influenza.—A report dated February 7, 1931, stated that in Scotland the number of deaths from influenza and other respiratory diseases was normal for the season. In Northern Ireland influenza had occurred in a few districts but not in real epidemic form. In the Irish Free State influenza was prevailing in Kilkenny, in Cork, and about Dublin. The outbreak in Liverpool was said to be declining during the first week of February. The general death rate in 107 great towns of England and Wales during four weeks of January, 1931, was 16.7.

A Physical Medical Section in the British Medical Association.—In view of the fact that an increasing number of medical practitioners are becoming interested in physical therapeutics a petition has been submitted to the Council of the British Medical Association asking that a new Section for Physical Medicine be established in the Association.

Katherine Bishop Harman Prize, 1932.—The Council of the Association will consider an award of this prize, of the value of £80, in the year 1932. The

prize is for the encouragement of study and research directed to the diminution and avoidance of the risks to health and life that are liable to arise in pregnancy and child-bearing. Within this sphere competitors are free to select the work they wish to present. All medical practitioners registered in the British Empire are eligible to compete. Should no essay be, in the opinion of the Council, of sufficient merit, no award will be made, but the prize will again be offered in the year following; in this event the money value will be increased. Each essay must be typewritten or printed in English. It must be distinguished by a motto, and accompanied by a sealed envelope marked with the same motto, and enclosing the candidate's name and address. Essays must reach the medical secretary (to whom inquiries may be addressed), British Medical Association House, Tavistock-square, W.C.1, not later than December 31, 1931.

Booking Seats for Out-Patients.—On January 27th the Victoria Memorial Jewish Hospital, Manchester, inaugurated a scheme designed to obviate the long waits of out-patients and based upon the theatre booking-office system. An office with a telephone and a plan of the hall with numbered seats has been installed, and each out-patient will be allotted a time at which he may attend and receive treatment without delay. As the patient leaves after treatment, or afterwards by telephone, he will book an appointment and receive a ticket coloured according to the doctor who is attending him. Doctors will also be able to book seats for out-patients by telephone. The out-patient attendances at this hospital exceeded 58,000, but since January 1st there has been a very large increase, chiefly of non-Jews. The hospital is to be enlarged at a cost of £40,000.

The Wellcome Foundation Medical and Chemical Research Building.—The Wellcome Foundation Ltd. is about to erect a new medical and chemical research building at the corner of Gordon Street and Euston Road, London, W.C.1, on the site, 225 feet by 135 feet, now partly occupied by their Bureau of Scientific Research. During many years the Foundation has maintained medical and chemical research laboratories, but recent developments have made it necessary to co-ordinate and extend these activities. The new building will furnish the additional accommodation required, and be provided with the most modern research equipment. Mr. Septimus Warwick, F.R.I.B.A., is the architect.

The Cameron prize of the University of Edinburgh for 1931 has been awarded to Madame Curie.

Alberta

After several years, there is now medical representation in the provincial legislature, in the persons of Dr. W. A. Atkinson, of Edmonton, and Dr. Harold W. McGill, M.C., of Calgary.

In reply to a question concerning the activities of the provincial "travelling tonsil clinic", the Hon. George Hoadley vouchsafed the information that during the past year this clinic consisted of two physicians, two dentists and four nurses, as well as four survey nurses. The duties of the survey nurses were to examine the children beforehand and make arrangements for those requiring minor surgical or dental services. In all twenty-seven centres were visited. In each centre the children were brought in from the various schools of the district. In some instances there were only five schools, in others there were from six to twenty schools represented. The work accomplished was as follows: children examined by survey nurses, 8,487; children examined by physicians, 3,329; children examined by dentists, 3,451; surgical operations performed, 828. There were no operations performed in hospitals; instead schoolhouses, halls, or other buildings, were used. Total cost of the

travelling tonsil clinic, \$31,133.38; total amount collected for surgical work, \$3,592.00; total amount collected for dental work, \$805.25; amount of promissory notes taken, \$7,556.75.

Of the 27 places visited 8 had resident physicians.

The Hon. George Hoadley presented the report of Dr. A. H. Baker, Superintendent of the Provincial Sanatorium for tuberculous patients at Keith. This was relative to the number of tuberculous patients in the province requiring sanatorium care, yet for whom there was no available accommodation at the sanatorium. He stated that at the present time there would be required an additional 180 beds to accommodate these patients. Many of these were in the incipient stage and a large number would likely recover if proper care were given them. The Hon. Mr. Hoadley stated that, owing to financial shortage, the provincial government could do nothing at the present time in the way of creating a new addition to the Provincial Sanatorium. A survey had been made of all the hospitals in the province to determine whether there was a possibility of caring for a certain number with little extra expense.

Owing to the fact that there are many disputed accounts between hospitals and municipalities, amendments to the various Municipal Acts will be presented during the present session of the legislature. In future three months' continuous residence at any time six months prior to entering a hospital, will constitute residence in that municipality. If the municipality has no hospital, then the hospital where the patient is admitted can collect the cost of hospitalization from the municipality where the patient had such residence. In years gone by, some municipalities made contracts with certain hospitals for the care of their indigents. If patients went elsewhere the municipalities denied obligations to the other hospital. The Act will be amended so that the hospital looking after the patient can collect such an account, but only at the rate that the municipality would have to pay to the contract hospital.

The forthcoming extra-mural post-graduate meetings, the first of this year under the auspices of the Canadian Medical Association, are anticipated with much interest. At least ten towns and cities in the province will be visited. The two speakers taking part in the program will be from the Western Ontario University. Dr. George Hale, Professor and Head of the Department of Medicine and Dr. George A. Ramsay, F.A.C.S., Assistant Professor of Orthopaedic Surgery. The subjects to be dealt with will be of general interest to the profession here.

G. E. LEARMONTH

British Columbia

The Pacific Coast Surgical Society, which includes in its membership surgeons of British Columbia, Washington, Oregon and California, held a four day convention from February 24th to 27th inclusive. The first two days were spent in Seattle, and the meetings then adjourned to Victoria.

At the present session of the Provincial Legislature the question of the illegal cults is again being discussed, and a bill to permit the chiropractors to conduct their own licensing examinations and to report vital statistics and contagious diseases has been introduced. The House contains six members of the medical profession, viz., Drs. L. E. Borden, of Nelson, W. H. Sutherland, of Vancouver, J. J. Gillis, of Merritt, G. K. MacNaughton, of Cumberland, H. C. Wrinch, of Hazelton, and C. M. Kingston, of Grand Forks. In addition representations have been made to the Government by deputations on behalf of the College of Physicians and Surgeons and the British Columbia Medical Association. Efforts during the past year to induce the Government to appoint a Royal Commission to investigate the subject, as

was done a few years ago in Ontario, were unsuccessful. As is usual, on these occasions, attempts are being made to create the impression that the medical profession are acting entirely on their own behalf rather than in the interests of the largely uninformed public.

On February 28th, the annual meeting of the North Pacific Society of Internal Medicine was held in Victoria. Members were present from Vancouver, Seattle, Portland and Spokane.

Dr. H. B. Maxwell, of Ladysmith, B.C., is relinquishing his practice and will shortly return to England. His practice is being taken over by Dr. D. P. Hannington, formerly of Kimberley, B.C.

News from the far north indicates that Dr. H. J. Nunn has moved from Atlin to Dawson City, and that Dr. L. G. C. D'Easum, formerly of Hedley, is now in Atlin. C. H. BASTIN

Manitoba

The Department of Mines and Natural Resources of Manitoba recently named Dr. Daniel Nicholson, Assistant Professor of Pathology, Dr. A. T. Cameron, Professor of Biochemistry, and Dr. Wardle, Professor of Zoology as a research and advisory committee to the Fisheries Board of the department. The appointment of Professor A. Bacjkov, outstanding research worker in fish culture problems, to the province services is likely in the near future. Prof. Bacjkov has been serving with the Biological Board of Canada.

The committee will devote its time to improving the stock of fish in Manitoba waters, in reducing production costs, and in advising on the eradication of tapeworm, which has been found in fish in Manitoba lakes. Recently the United States Government put an embargo on tullibee which entails considerable loss to Manitoba fishermen. The Manitoba Government is determined to do everything possible to improve conditions as regards commercial fishing, and to put the fish industry of the province on a wealth-producing basis.

The Department of Health and Public Welfare of Manitoba is trying to stamp out trachoma in Manitoba. During the last two years a survey has been conducted during which 10,000 cases of eye diseases have been examined, with the result that 400 cases of trachoma were discovered. The disease has established itself in the southern part of the province, especially in the district between Gretna and Morden. The Department of Health offers to pay one-quarter of the cost of clinics and treatment and the municipalities involved are asked to take care of the rest of the expenses.

The Cancer Relief and Research Institute has recently passed a resolution to the effect that radium or its emanations would be issued only to physicians who have spent at least two months in intensive study of radium and its emanations at a recognized clinic, or who have had equivalent practical experience, and who undertake to provide the Board with a complete record of all patients treated. ROSS MITCHELL

New Brunswick

At the present sitting of the Legislature, a new hospital act is up for discussion. This act is being introduced as a private bill by Dr. H. I. Taylor. The bill is sponsored by the New Brunswick Hospital Association, and was drawn up by Mr. George Gilbert, K.C., Mayor of Bathurst.

Hospital legislation in the province has, in the past, not been entirely satisfactory. The new bill is intended: first, to more clearly designate the legal

settlement of an indigent patient; secondly, to facilitate the collection of fees by a hospital for the treatment rendered to indigent patients from an outside county; thirdly, to provide legislation to enable the counties to assess for the care of pauper patients; fourthly, to provide minimum standards for training schools for nurses; fifthly, to define and provide minimum requirements for a public hospital; sixthly, to regulate the use of narcotics in hospitals; seventhly, to regulate the administration of anaesthetics.

A considerable amount of opposition is expected to this bill. The Medical Society is particularly interested in the administration of anaesthetics as it has become the practice in some hospitals to entrust the anaesthesia department to nurses. The Medical Society feels that anaesthesia is definitely a part of the practice of medicine and that anaesthesia should be in the hands of medical men only. The New Brunswick Medical Society is represented at Fredericton by a select committee of the Executive of the Society.

The number of influenza cases reported, although not alarming, is yet sufficient to indicate that influenza is still the very dangerous enemy known during the war years, and quite a number of the present cases show blood spitting and bronchopneumonia, and convalescence has been extremely slow. Several of our physicians in New Brunswick have been sufferers from this disease in the last few months.

A committee, composed of Dr. O. E. Morehouse, District Medical Health Officer, and Dr. A. F. VanWart, of Fredericton, is pressing for the establishment of a new isolation hospital at Fredericton, the present building being deemed inadequate.

New regulations in the administration of Red Cross outpost hospitals in New Brunswick include one which states that "nurses employed in such hospital shall be duly registered nurses in good standing in their provincial organization".

The Hon. Dr. H. I. Taylor, Minister of Health and Labour, is this year attending his twenty-fourth session of the Legislature of New Brunswick. Dr. Taylor was first elected member of the Provincial Legislature for Charlotte County in March 3, 1908, and has continuously represented this constituency. At the time of his entrance to politics, in 1908, Dr. Taylor was so occupied with his large medical practice that he did not attend the nominating convention and never once appeared on a public platform during the campaign of that year. Dr. Taylor is Dean of the present Legislature.

Dr. F. H. Wetmore, of Hampton, has announced his retirement from general practice, and will confine himself in the future to consultation work. Associated with Dr. Wetmore, Dr. Vernon A. Snow (McGill, 1927) will practise in Hampton, N.B.

Dr. Donald F. W. Porter, of Saint John, has been elected the new President of the New Brunswick Division of the Canadian Red Cross.

Dr. H. A. Wheaton, of Sussex, has returned to his practice after an extended course of post-graduate study.

Nova Scotia

The Halifax Visiting Dispensary, one of the old established institutions of Halifax, which has served the community for nearly three-quarters of a century, held its annual meeting recently when its work for 1930 was reviewed. More than 5,000 prescriptions were filled for necessitous persons, and several hundreds of packages of surgical dressings were given

out. Nearly a hundred packages of maternity supplies were furnished upon recommendation of Victorian Order nurses. Visiting physicians made some 840 calls to the homes of patients. Several needy persons were supplied with dentures and several with spectacles. Milk tickets were issued to a considerable number of undernourished children and others. Radium treatment was secured for 20 cancerous patients, and milk and other necessities were supplied to several such patients.

The chairman of the Board of School Commissioners for the City of Halifax, in his report for 1930, states that the Board is now in the happy position of having all classes on full time for the first time since December, 1917, when so much destruction to its buildings was wrought by the explosion of a French munition ship in Halifax harbour. The reports of school physicians, dentist, and nurses show that a large amount of work was done on behalf of the health of the pupils. Dr. Woodbury states that the outstanding feature of his year's work was the decrease in the number and severity of medical and surgical defects. Crippling deformities and the parasitic conditions, once so common, have almost disappeared.

The nurses' residence of the Halifax Children's Hospital has been completed and makes a fine addition to the group of buildings in what is known locally as "the hospital area." The vacation of the quarters formerly occupied by the nurses is to be followed by the adaptation of those quarters to hospital purposes, and it is anticipated that accommodation will thus be provided for at least 25 additional beds.

The appointment of Dr. George A. MacIntosh to succeed the late Mr. W. W. Kenney as Superintendent of the Victoria General Hospital has met with universal commendation. Several years ago Dr. MacIntosh fell victim to a vicious infection which necessitated high amputation of his right arm. He was in consequence obliged to relinquish a very large practice, and accepted a position as medical officer of the hospital. He is thus already familiar with the affairs of the institution, has had much administrative experience, and has proved to be a courteous, painstaking and capable official. In assuming larger responsibilities he has the confidence and good wishes of a host of warm friends.

It is expected that an effort will be made during the present session of the provincial legislature to secure amendment of existing legislation in order that the government may be empowered to increase the per diem grant now available to local hospitals. Articles have appeared in newspapers published in various parts of the province in which reasons are set forth for greater governmental consideration of local hospitals. For approximately half a century the provincial government has assumed responsibility for financing and managing the Victoria General Hospital, and during that time has added greatly to its capacity, equipment and general well being. The only aid given to local hospitals from the provincial treasury has been a small per diem allowance for each patient treated. Increasing costs in hospital maintenance make it increasingly difficult for local hospitals to carry on. As the number of local hospitals has increased the proportion of non-Halifax residents admitted to the Victoria General Hospital has decreased, and it is urged that the present arrangement is discriminatory against other cities and towns in favour of Halifax. What is now the Victoria General Hospital was formerly the City and Provincial Hospital, maintained jointly by the city and province. When the province assumed full responsibility, the city ceded its interest in buildings and grounds to the province—

with an understanding relative to maintenance costs of patients chargeable to the city. So there are complexities in the problem which make it somewhat difficult of solution.

W. H. HATTIE

Ontario

Establishment throughout Ontario of a system of diagnostic clinics or clinical laboratories, so designed and equipped as to bring to the assistance of the country physician at low nominal fees all the scientific handling of diagnostic problems that is enjoyed by his fellow-practitioners of the larger urban centres, is now being planned by the Henry Government.

Each clinic will be equipped, it is understood, for all types of x-ray work, basal metabolism, blood chemistry and blood microscopy, and the investigation of all manner of pathological tissues or fluids, and will be manned by a staff of experts selected by the Department of Health, under Hon. Dr. John M. Robb. Legislation providing for this new and radical departure in the health history of this province will, it is expected, shortly be brought down to the Legislature.

So far as can be learned now, the Government proposed first to establish a trial clinic, and a money vote of sufficient proportions (\$20,000) to cover the installation of the same is included in the supplementary estimates, which were placed before the House a few days ago. The arrangement will be extended gradually until some ten or twelve clinics, adequately serving the needs of the province, will be in operation.

In the event of the Government adopting, as expected, a policy of free radium treatment for all cancer sufferers, the clinics will probably be utilized as distribution stations for the same.—*Toronto Globe*.

Arrangements are being made by the Government to transfer all criminally insane patients to the new Provincial Hospital which is to be constructed at Penetanguishene. When this building is completed, all criminally insane now at the Ontario Reformatory, Guelph, will be moved to Penetanguishene.

Some little time ago plans were under consideration for the erection of a new municipal hospital at London, Ontario, at a cost of approximately \$1,500,000. This idea has now been dropped in favour of the erection of a new \$200,000 wing at Victoria Hospital.

The Junior League has recently contributed in the neighbourhood of \$10,000 to the Hospital for Sick Children, Toronto. This money is being used to purchase 300 scientifically constructed cots to replace that number of beds now in use.

Plans are now under way for the commencement this Spring of the new Women's College Hospital on Grosvenor Street. The main portion of the hospital, which will be erected first, will cost about \$400,000, and will include laboratory, operating room and kitchen equipment, and accommodation for about 80 beds. Additions will be erected as required, the completed plans providing for about 250 beds. This hospital is the only one of its kind in Canada, being controlled entirely by women.

The class of 1931 at Western Ontario Medical School is sponsoring a fund to be used in perpetuating the memory of their late teacher and friend, Dr. Alfred J. Grant, who was so beloved by all. This was the last class taught by Dr. Grant. The objective is an endowment fund of \$1,000, the interest from which will be administered by a committee composed of the President of the University, the Dean of the Medical School, the Professor of Surgery and a representative of the class. One hundred per cent of the class are making contributions to the fund.

J. H. ELLIOTT

Dr. J. Playfair McMurrich, Professor Emeritus of Anatomy, University of Toronto, has received several honours during the past few weeks. He has been appointed Canadian representative of the Osler Club in London, a club which devotes its energies to the study of science; he has been made vice-president of the History of Science Society of America; and he has been made a corresponding member of the Comité Internationale d'Histoire des Sciences of Paris—an organization which restricts its executive members to 25 and has but 50 corresponding members in the world. In addition, Professor McMurrich has been made an honorary member of the American Society of Naturalists. These honours have been conferred largely because of the publication in 1930 of a book entitled "Leonardo da Vinci: Anatomist," on which Professor McMurrich worked for ten years at the request of the Carnegie Institution of Washington.

Quebec

The annual meeting of the Royal Victoria Montreal Maternity Hospital was held on February 17, 1931, Sir Charles Gordon presiding. A record for activity was made during 1930. In the Hospital 2,438 births took place and 408 on the outside service.

Sir Andrew Macphail, who spoke briefly in moving the adoption of a group of reports, showed how the work has grown since was started in two re-modelled rooming houses on Dorchester street west. At that time there were 12 available beds.

Dr. W. W. Chipman, for many years director of the work, stated that "during our first five years on St. Urbain street, from 1905 to 1910, there were born 2,651 babies, while during the single year of 1930 there were 2,846.

Dr. J. R. Fraser, stated that "there has been definite and progressive lowering of the maternal and infant death rates in this hospital over a period of years, which becomes the more remarkable in the light of the tremendous growth which has occurred.

"Each year the hospital has assumed a larger proportion of the urgent and emergency cases of this city and environs. Aside from the staff, 70 physicians have attended cases here, an indication of the large part this clinic is playing in the life and health of the community. The increase in number of cases over 1929 was 168."

Another phase of the work carried on by varied clinics, that of the cancer clinic, established through the generosity of Mrs. W. W. Chipman, was paid particular reference to by Dr. Fraser. "This is one of the very few cancer clinics in Canada," he said, "devoted exclusively to gynaecology. It exerts a wide and much appreciated influence, not only in this city but throughout Canada, for patients are being treated here from all parts of our country.

"During the past five years, 138 cases of special cancer have been treated by radium; 63 are alive. Many of these would have been hopeless, save for the radium; 25 per cent are alive after five years."

Obstetric social service during the past year included 1,429 interviews, a total attendance at clinics of 4,765, and 1,221 home visits.

The settlement clinics showed a remarkable growth. In 1929 a total of 2,373 patients were attended, while during the past year this number jumped up to 3,037.

Courses in obstetrics had been completed by 220 nurses and in gynaecology by 86, including students from hospitals in St. Johns, Que., Moncton, N.B., Sherbrooke and Bermuda. Nursing visits to district cases totalled 5,856, while 48 outdoor cases were referred to the Victorian Order of Nurses.

Two legacies amounting altogether to \$7,000 have been received by the board of management of the Montreal General Hospital. The legacies are from the

estate of the late Mrs. Elliott H. Busteed (\$6,000), and from the estate of the late Mrs. Isabel M. Archibald.

Saskatchewan

In 1919 the late Dr. Seymour thought that a cash grant to expectant mothers in the province might help to reduce the maternal mortality, so he introduced the Maternity Grant. This must be applied for before the birth of the baby. When application is made \$10 is sent to the mother to buy clothes for the baby and other necessities for the confinement; the other \$15 is paid to the doctor, or to the nurse if no doctor is present; if neither a doctor nor a nurse is present \$15 is paid to the neighbour woman if she stays ten days with the patient.

In 1928-29 the grant was paid in 1,122 cases, divided thus: to 703 doctors, to 92 hospitals, to 139 nurses, to 188 neighbour women or practical nurses. This grant has never been paid to a mother living in a village, town, or city, but only to rural patients who can prove that they need the grant. In January, 1931, 365 mothers were assisted, or about 20 per cent of all women who became mothers in January in the province.

The following table shows the growth of the work.

<i>Fiscal year</i>	<i>Grant paid</i>	<i>No. of mothers</i>	<i>Maternal mortality</i>
1919-20	\$ 441	18	5.3
1920-21	3,120	125	5.3
1921-22	6,275	253	5.0
1922-23	6,855	286	5.2
1923-24	9,469	427	6.5
1924-25	10,595	417	5.5
1925-26	11,852	496	6.9
1926-27	8,450	505	5.4
1927-28	11,100	467	5.8
1928-29	12,964	585	6.2
1929-30	25,258	1122	
1930-31 (for 10 mos.)	45,901	2191	
1930-31 (estimated)	60,000		

The hope of Dr. Seymour, that of reducing the maternal mortality, has not been realized, but the infant mortality has come down from 88.1 in 1920 to 73 in 1929. This is probably due to a combination of factors. Of the infant mortality 38 per cent is in infants under 1 day, and 54 per cent is in infants under 1 month. Of the births 61.3 per cent take place in the rural municipalities. In 1929 a doctor was in attendance at 73.4 per cent of the births, a nurse at 1.1 per cent of the births and neither a nurse nor a doctor in 25.5 per cent of the cases.

The question of the treatment of city indigents was discussed at the February meeting of the Regina and District Medical Society. The gradual encroachment of the medical health officer on the domain of the private practitioner was noted. A committee was appointed to take up this matter with the city medical health officer. Refusal by the city commissioner to pay for obstetrical attention to an indigent case was reported by one of the members. It was pointed out that rural cases receive a maternity grant of \$25 from the provincial government, but that this grant could not be obtained by city indigents.

The 1929 report of the Saskatchewan Anti-Tuberculosis League is just off the press. Here are some of the interesting statements from the Medical Director's report. "The year 1929 marks the effective launching of the preventive program of the League. At this date preventive effort has outstripped curative in the campaign to control tuberculosis. Having provided curative treatment for the sick and care for the dying, the League has moved on to attack the contagion at its

source—the diagnosis of suspects, the reduction of spread by investigation and elimination of centres of infection, the examination of contacts in anticipation of breakdowns. In short, tuberculosis is now being dealt with not merely as a serious illness but as a serious infectious disease, an epidemic. The foundation of this attack was laid by the Sanatorium Act of 1929, providing free treatment for curative and isolation purposes and free diagnosis for preventive purposes.

"The first result of free treatment was a gathering in of the hopeless sick from their homes to institutions. The homes having been cleared, the effect of removing the financial barrier is earlier treatment, earlier isolation, and an increase in the length of treatment and the gross cost, but the end result will be more cures and a shorter period of disability, lessened spread of disease, a lower death rate, and eventually fewer new cases.

"With free treatment for tuberculosis, as a measure of prevention, came free diagnosis of all cases referred by physicians, in order through earlier diagnosis to reduce the period of treatment and the cost. What was the result? The result of removing the financial barrier was an increase of 100 per cent in the number of persons referred for diagnosis. The measure was effective; those unable to pay were referred. Under the pay-for-diagnosis policy operating in 1928, 19.2 per cent of suspects referred were found to have active tuberculosis, and under the free treatment policy of 1929, 20 per cent, so that there is no evidence of carelessness or abuse of the provision for free diagnosis of tuberculosis."

The Indian Department has appointed a full time physician as the Medical Superintendent of the Qu'Appelle Indian Health Unit. Dr. A. B. Simes is in charge of this work. It is hoped that after a few years' experience a practical plan for the reduction of tuberculosis on the Indian Reserve will be evolved. At the present time these Indian Reserves constitute islands of tuberculous infection throughout the province where the death rate is on the average twenty times as high as that found among the white population of the province.

Of the 699 actively tuberculous patients treated in 1929, 106 were farmers and 103 farmers' wives; 96 were school students; 12 were stenographers and 9 were nurses-in-training.

The indefatigable osteopaths had a bill submitted to the legislature, asking for a separate board of examiners for osteopaths, but the bill was killed in committee.

The following resolution moved by Mr. Patterson (Milestone) was passed by the Saskatchewan Legislature: "That in the opinion of this Assembly the Government of Saskatchewan should take into consideration the advisability of instituting, without undue delay, a comprehensive policy in connection with the Mental Health Program, as announced by the Minister of Public Health, as follows: (1) The requirement of certificates of Medical Health Officer preliminary to the securing of a marriage license; (2) eugenic sterilization under adequate supervision for those for whom the vital interests of society require it."

It was moved that free treatment for tuberculosis be given only to the poor of the province, not to anyone who has tuberculosis, as is now done. This motion was overwhelmingly defeated.

At a recent staff meeting of St. Paul's Hospital, Saskatoon, Dr. D. Croll presented a case of a fracture of the os calcis, also an old Potts fracture. Dr. A. L. Lynch presented two cases of splenectomy for acholuric familial icterus. He spoke of the indications and the difficulties of removal of the adherent spleen. Professor McGibbon described the physiology and the gross and microscopic anatomy of the spleen. Dr. W. Lindsay

discussed the types and genesis of the splenomegalies. Dr. L. Schulman remarked on the increased fragility of the red cells in this condition. Dr. D. Baltzan said there were many cases of acholuric jaundice of mild degree which did not require surgical measures.

Dr. F. B. Walsh, F.R.C.S., Edin. 1928, of Estevan, has obtained a three year Fellowship in Ophthalmology at Johns Hopkins Hospital. LILLIAN A. CHASE

United States

New York Regulates Blood Donors.—The department of health of New York City has adopted codes and regulations governing blood donors. These regulations provide for the registration and supervision of blood donors according to definite rules. A "blood donor" means "any person who holds himself out as willing to dispose of his blood, or who offers his blood, or whose blood is used for transfusion purposes, for a fee." No person can act as a blood donor in the sense just indicated without a certificate of registration from the department of health. This certificate is good for one year only. The applicant for registration must furnish the report on an official form by a licensed physician, giving the results of a competent physical examination made not longer than seven days before the application is presented. No person may be registered who is below standard in weight; whose blood is not negative on the Wassermann or the Kahn test; who has a positive syphilitic history or who exhibits suspicious scars or symptoms of syphilis or who gives a history of malarial infection or who presents evidence of any disease of the heart, hyperthyroidism, asthma, status lymphaticus, tuberculosis, venereal disease or any communicable disease or evidence of drug addiction; whose blood group has not been determined, or who has been found to be a "dangerous universal donor." Every certified donor must keep a personal record book furnished him by the department of health, with personal description, photograph, signature, blood group, reports of physical and other examinations, and the transfusions in which he acts as donor. Not more than three weeks can elapse between his giving blood in transfusion and a new physical examination, the results of which are to be recorded in his blood donor's registration book. "No blood donor shall be accepted whose hemoglobin is found to be less than 85 per cent of the normal for the method employed." Again, no donor shall be used whose blood has not been found to be negative to standard tests for syphilis by the department of health within six months before a transfusion. By this test and by the repeated physical examinations, syphilitic infection since certification should be detected. Finally, immediately prior to transfusion, the physician in charge must examine the donor to determine whether he is in a normal state at that time. The regulations provide also for full records and reports of transfusions by physicians and hospitals, which are transmitted to the department of health or, in the case of certain hospitals, are always accessible to its inspectors. While "no transfusion shall be made unless from a registered blood donor," it is provided that "in the case of an emergency a husband or wife, a parent or child or a relative or friend may be used as blood donor." The certificate of registration is revocable in case the donor contravenes any regulation or gives indications of syphilitic, tuberculous, malarial, typhoid or any other communicable infection or of having given too much blood. Agencies for blood donors may not be maintained without permit from the department of health and may not employ any other than certified donors.—*J. Am. M. Ass.*, 1931, 96:

The New York Post-Graduate Medical School.—The incorporation in the educational system of Columbia

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University of the New York Post-Graduate Medical School and Hospital, the oldest institution in the United States engaged solely in the teaching of post-graduate medicine, was announced at the annual dinner of the Post-Graduate Faculty Association held at the Biltmore Hotel on January 31st.

The agreement between the two institutions, effective July 1, 1931, makes the Post-Graduate an integral part of the Columbia University teaching system and, in the future, the centre of a comprehensive program of post-graduate medical teaching sponsored by Columbia.

To carry out the program for placing all of the post-graduate teaching on a university basis, provision for an interlocking of the governing bodies, has been made. President Butler has been elected a member of the Corporation and of the Board of Directors of the New York Post-Graduate Medical School and Hospital. Dr. Butler also becomes president *ex-officio* of the Medical School of the Post-Graduate.

Dr. Chace has been elected president of the Post-Graduate Medical School and Hospital to fill the vacancy caused by the retirement some time ago of Dr. James F. McKernon, who had occupied this post for twenty-five years. To coordinate the work of the Post-Graduate with Columbia University, an Administrative Board of Post-Graduate Studies in Medicine, on which both bodies are represented, has been established.

Johns Hopkins School of Medicine.—Dr. William H. Welch, Professor of the History of Medicine, and Dr. William H. Howell, Professor of Physiology and Director of the School of Hygiene and Public Health, will retire in June. Dr. Welch, who will be 81 in April, was the first Professor of Pathology at Johns Hopkins University School of Medicine, having served in that capacity from 1884 until 1916, when he became first Director of the School of Hygiene and Public Health. In 1926 he resigned that position to accept the newly created Chair of the History of Medicine. His retirement will mark the passing from active service at the Johns Hopkins of the last of the "Big Four"—Osler, Halsted, Kelly, and Welch—around whom the School of Medicine was built. Dr. Howell, also a potent factor in the development of the School of Medicine, who will be 71 this month, has been Professor of Physiology since 1893. In 1926 he succeeded Dr. Welch as Director of the School of Public Health and Hygiene.

The American Public Health Association.—The Sixtieth Annual Meeting of the American Public Health Association will be held in Montreal, September 14-17, and the headquarters will be at the Windsor Hotel.

It is hoped that many members of the Canadian Medical Association will see fit to attend that meeting. There are many phases of the work of the American Public Health Association reflected in its annual meeting programs which are of great interest to the practising physician.

The American Association for the Study of Goitre.—The meeting of this association will be held at Kansas City, Mo., from April 7th to 9th, inclusive. Addresses, papers and round table discussions are included in the program, and diagnostic and surgical clinics will be held. Two symposia are listed—one on "The goitre heart" and the other on "The preparation and after-care of operative cases." Canadians who will take part are Dr. Gordon Fahrni, of Winnipeg, and Dr. Ambrose Lockwood, of Toronto. Dr. Arnold Jackson, Madison, Wis., is the Chairman of the Program Committee.

Dr. Carrel awarded A Cancer Prize.—The Dr. Sophie A. Nordhoff-Jung Cancer Prize for the best work of recent years in the field of cancer research was, by the unanimous decision of the commission entrusted with the distribution of the prize, conferred on Dr. Alexis Carrel of the Rockefeller Institute for Medical

Research. The commission was composed of Professors Borst, Doderlein, von Romberg, and Sauerbruch. The citation reads:

"Dr. Carrel has added new laurels to his great services to surgery by his development of the method of tissue cultivation and by his clear-sighted application of it in the solution of the basic problems of pathological growths, especially of the growth of malignant tumours."

The Ella Sachs Plotz Foundation.—In the seventh annual report of the Ella Sachs Plotz Foundation for the Advancement of Scientific Investigation, it is announced that seventy-eight applications for grants were received by the trustees in 1930, sixty-two coming from twelve different countries in Europe and Asia, and the remaining sixteen from the United States. The total number of grants made during the year was twenty-five, twenty-one being awarded to scientists of countries outside the United States. Applications for grants during the year 1930-31 should be sent, before May 1st, to Dr. J. C. Aub, The Collis P. Huntington Memorial Hospital, 695, Huntington Avenue, Boston, Massachusetts. At present researches likely to be favoured in respect of grants are those directed towards the solution of problems in medicine and surgery, or allied branches of science. Grants may be used for the purchase of apparatus and supplies for special investigations, or for the payment of unusual incidental expenses.

The Supply of Nurses.—Facts about the distribution and availability of graduate nurses in the United States have recently been gathered by the Committee on the Grading of Nursing Schools. They find that 54 per cent of 24,389 graduate nurses who are still active in the profession are engaged in private duty nursing. This sample of nurses is taken from 10 States, and is believed to be representative of the more than 210,000 graduate nurses working in this country. Some 4,000 doctors agreed that there is no shortage of nurses. However, the proportion of nurses to population is much less in the rural communities than in the cities. This is no doubt largely due to the greater wealth of city dwellers. The committee state that there is "a real need for the services of graduates nurses with high professional standards of nursing care" in these rural communities.

Psittacosis Infection from Love Birds.—Five cases of a disease believed to be psittacosis, with one death, were recently brought to the attention of the health authorities in Brooklyn, N.Y. All of the cases were in related persons who had had contact with love birds brought from Havana, Cuba, on December 31, 1930.

A man who had cared for two of the birds fell sick of what was at first diagnosed as pneumonia on January 13, and died 5 days later. Shortly afterwards four women, all related to the dead man, and who had been exposed to the birds and in close contact with each other, became ill. While the clinical picture of these cases was strongly suggestive of an infection of influenza with bronchial pneumonia complication, it is believed on later clinical and epidemiological evidence that the love birds were the original source of infection, and that the disease is the same as that caused by infected parrots during the winter of 1929-30.

General

Royal College of Physicians and Surgeons of Canada REGULATIONS FOR CANDIDATES RELATING TO THE EXAMINATION FOR THE DIPLOMA OF FELLOW SECTION I

Examinations

1. The Examination for the Fellowship is divided into two parts, *viz.*, the first examination, or Primary; and the second examination or Final.

Clinical and biological** observations show conclusively that a vitamin concentrate of Cod Liver Oil, when incorporated with dry powders (as used in the preparation of tablets) exhibits a definite tendency towards ---*

destruction of vitamin A



The Vitamin A in Ayerst "Calcium A" capsules is preserved in oil

1925

Ayerst "Calcium A" was introduced to the medical profession in soluble gelatin capsules in which the vitamin content was preserved in an oil medium.

1927

The J.A.M.A.* reporting observations of Hart, Steenbock and others on vitamin concentrates of Cod Liver Oil questioned the advisability of attempting to supply them to man in the form of dry concentrates unless given in oil.

1931

The Journal of Biological Chemistry** published a paper entitled "The Destructive Action of Finely Divided Solids on Vitamin A" in which it is observed that a vitamin concentrate of Cod Liver Oil mixed with granulated lactose as used in the manufacture of tablets resulted in the destruction of Vitamin A.

Ayerst, McKenna & Harrison, Limited, have refrained from following the present tendency toward Cod Liver Oil concentrates in tablet and pill form because the test of extensive clinical experience with "Calcium A" in its present capsule form verifies the principle of Vitamin A preservation which governs its manufacture.

Each "Calcium A" capsule presents the Vitamin A and D content of a teaspoonful of Cod Liver Oil combined with calcium and phosphorus salts preserved in a natural and scientifically approved oil medium.

*Journal of American Medical Association, Aug. 27, 1927, page 694.

**Journal of Biological Chemistry, February, 1931, page 507.

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2. The subjects of the Primary Examination are:—
 - I. Anatomy, including Histology and Embryology.
 - II. Physiology, including Biochemistry.

NOTE: In the case of candidates who have graduated in Medicine in 1925 or prior thereto, a general knowledge of these subjects will be required.

3. The subjects of the Final Examination are:—
 - (a) For the Fellowship in Medicine:
 - I. The Principles and Practice of Medicine, including Therapeutics, Preventive and Forensic Medicine.
 - II. Pathology, including Bacteriology.
 - III. Also, one or more special branches of Medicine if elected by the Candidate and approved by Council.
 - (b) For the Fellowship in Surgery:
 - I. The Principles and Practice of Surgery, including Operative Surgery and Surgical Anatomy.
 - II. Pathology, including Bacteriology.
 - III. Also, one or more special branches of Surgery if elected by the Candidate and approved by Council.
4. The Primary Examination is partly written and partly oral, and must be passed as a whole. The Final Examination is partly written, partly clinical and partly oral, and also must be passed as a whole.
5. The Primary and Final Examinations are held in the month of September or October. The exact date and place will be announced annually before July 1st.

SECTION II

Conditions of Admission to the Primary Examination

1. The Primary Examination may be taken at any time after the candidate has completed a course of study and passed the examinations in Anatomy, Histology, Embryology, Physiology and Biochemistry in a Medical School or University approved by Council. The candidate must submit a certificate thereof with his application.
2. Application for the Examination must be submitted before July 1st, on the proper form.

SECTION III

Conditions of Admission to the Final Examination

1. A candidate must have passed the Primary Examination of this College.

NOTE: In lieu of this, the Primary Examination of the Royal College of Surgeons of England will be accepted.
2. The candidate shall be a graduate of not less than three years' standing of a Medical School or University approved by Council.
3. The candidate must produce evidence of having been engaged in the study (or study and practice) of the profession for not less than three years subsequent to the date of obtaining the medical degree, one year of which shall have been spent in attendance upon the medical or surgical practice of a hospital approved by Council.
4. The candidate shall hold a licence to practise Medicine in at least one of the provinces of Canada.
5. When applying for admission to the Final Examination, a candidate must elect to be examined for either the Fellowship in Medicine or the Fellowship in Surgery.
6. Application for the Examination must be submitted before July 1st, on the proper form.

SECTION IV

Languages of Examination

Candidates at the time of making application for either the Primary or the Final Examination shall indicate whether they desire to be examined in the French or English language. Application forms may be obtained in either language.

SECTION V

Fees

The fees for the Examinations and Diploma are as follows:—

Primary Examination .	\$ 50.00
Final Examination	100.00
Admission to Fellowship	100.00

Fees for examinations must be deposited with the Registrar-Secretary prior to the 15th of August, and all cheques made payable at par in Toronto.

T. C. ROUTLEY,
Registrar-Secretary, Royal College of Physicians and Surgeons of Canada.

N.B.—All communications with reference to examinations for the Fellowships should be addressed to the Registrar-Secretary, Royal College of Physicians and Surgeons of Canada, 184 College Street, Toronto.

An International Trachoma Prize.—The Hungarian Minister of Public Welfare and Labour offers a prize of 2,000 Swiss francs as a reward for original work on the etiology of trachoma. Essays intended for the competition must be addressed to Eye Clinic No. 1 of the Royal Hungarian Peter Pázmány University, Budapest (VIII, Mária-utca 39) not later than June 30th next. Works that have already appeared in print are eligible equally with essays specially written for the occasion. The jury of award may also consider works not submitted for competition but appearing in print between July 1, 1929, and June 30, 1931. Essays submitted may be written in German, English, French, Italian, or Hungarian. The jury of award is appointed by the Minister, and consists of Mr. A. F. MacCallan (London), Dr. Victor Morax (Paris), Professor L. Maggiore (Bari), and Professor Carl Prausnitz (Breslau). Its decision will be announced not later than December 31, 1931.

Third Congress of the Pan-American Medical Association.—The Organization Committee of the Third Congress of the Pan-American Medical Association issues a cordial invitation to those who are interested among English, Spanish, French and Portuguese speaking doctors of Pan-America for the next meeting which will be held in the city of Mexico from July 26 to 31, 1931, under the auspices of the government of the Republic of Mexico.

This conference meets for the purpose of maintaining and promoting a more intimate understanding between the medical men of the New World, and, with the efforts of many prominent North- and Latin-American physicians, great success has been accomplished in the past meetings.

CONSTITUTION AND BY-LAWS OF THE PAN-AMERICAN MEDICAL ASSOCIATION

Article 2.—*Object of the Association:* Section 1—The object of this organization shall be: to promote more intimate relations among physicians and surgeons of the Western Hemisphere; to develop friendship and to advance medical knowledge, such as the possibility of an interchange of doctors for the purpose of presenting medical courses and holding meetings in different countries; the exchange of medical literature and of the dissemination of information regarding scientific investigations, and to create an international lending library; to develop an inter-American medical literature by means of official publications.

The proceedings of these Congresses reveal that record of achievements so necessary for the better scientific knowledge among our countries, and a step toward international medical progress.

A scientific and commercial exposition will take place where the sessions are to be held.

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FOR SALE.—Will sell my house in a good mixed farming community. \$5,500 total, \$3,500 cash, balance to suit. Good district, very little opposition, 20 to 25 mile radius. Reason—wish to go to Europe for post-graduate studies. Apply Box 119, C.M.A.J., 3640 University St., Montreal.

WANTED—A young doctor qualified to take charge of x-ray department and assist in physiotherapy in a large city practice. Apply with full particulars to Box 148, C.M.A.J., 3640 University St., Montreal.



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Information can be obtained from: Dr. Francisco de P. Miranda, Executive Secretary of the Organization Committee, Departamento de Salubridad Publica, Mexico City, Mexico. Dr. Conrad Berens, Treasurer, Pan-American Medical Association, 35 E. 70th Street, New York, N.Y. Dr. José E. Lopez-Silvero, Executive Secretary of the Pan-American Medical Association, Secretaria de Sanidad y Beneficencia, Havana, Cuba.

Book Reviews

Cancer (Comprising International Contributions to the Study of Cancer in Honour of James Ewing).

Edited by Frank E. Adair, M.D., F.A.C.S., Attending Surgeon to Memorial Hospital, New York. XIX and 484 pages, 168 illustrations. Price, \$10.50. J. B. Lippincott Company, 201 Unity Bldg., Montreal.

This splendid work deals with the growingly important subject of cancer under four headings: [Cancer in its General Relations; Cancer Research; Regional Cancer; and Radium and Röntgen Ray Therapy. It is a *Festschrift* in honour of Professor James Ewing on his sixty-fourth birthday. The tribute is truly an international one, for in addition to the American contributors, many of whom were pupils and associates of Professor Ewing, we notice the names of well-known authorities in other countries, notably, Sir Lenthal Cheate, W. Cramer, W. Sampson Handley, W. S. Lazarus-Barlow, and Sir Charles Gordon-Watson, of England; J. Maisin, of Belgium; G. Roussy, C. Oberling, Cl. Regaud, G. Griceuroff, and A. Lacassagne, of France; H. T. Deelman, of Holland; F. Blumenthal, H. Auler, and H. Wintz, of Germany; R. Bastianelli, of Italy; and J. Heyman, of Sweden. We are pleased to note also the names of two men of Canada, Prof. P. Masson, of the Université de Montréal, and Dr. J. E. Gendreau, of the Radium Institute in Montreal. There can, then, be no question as to the authoritative character of the numerous articles. The book is fittingly introduced by a note of appreciation from Prof. William H. Welch and a foreword by the Editor, Doctor Adair. We may be allowed to quote a sentence from the latter. "The problems of cancer are so numerous, so widely divergent and so baffling that it seems timely to assemble the most recent knowledge on the various subjects of cancer research, pathology, surgery, and radiotherapy from the scattered clinics and laboratories of Europe and America." This task has been most effectively done. The medical man interested in cancer, and all should be, will find here conveniently discussed such subjects as Natural Law in Pathological Growth, The Present Status of the Cancer Problem, Resistance and Susceptibility to Cancer, Heredity and Cancer, Cancer a Systemic Disease, the different phases of experimental cancer research, the local types of malignant growths, and the use of radium and x-rays in the treatment of cancer, and discussed by acknowledged masters. Professor Ewing is to be congratulated on the fact that the *Festschrift* dedicated in his honour is so singularly appropriate and contains material so worthy of the distinguished contributors and so worthy for its purpose. For a clear, helpful statement of the cancer problem as it exists to-day and the extent of our knowledge on the matter it would be hard to imagine anything more effective than this book.

The History of Pædiatrics. George Frederic Still, M.A., M.D., Hon. LL.D., F.R.C.P., Professor of Children, King's College, London, etc. 526 pages, illustrated. Price \$7.50. London: Oxford University Press; Toronto: McInsh & Co., 1931.

A well written history of the past has always an interest for the thoughtful reader. To the physician the story of the evolution of the science of medicine, hindered as it was in its early beginnings by an ingrained belief in the influence of the supernatural, affords an instructive story of strivings and failures. In the present volume Dr. Still presents us with a delightfully told story of the gradual growth of pædiatrics, a term, which, under his pen, includes not only the knowledge of disease in children but also a knowledge of the feeding and dearing care demanded by the infant.

From early ages those practising medicine appear to have recognized that infants and children presented features peculiar to themselves in the phenomena of their development and in the character and treatment of their ailments which often proved more difficult of management than the diseases of adults. Possibly as a consequence, ailments of children occupy only a small place in the earlier medical writings, and were apparently relegated to the care of midwives and nurses and their superstitious traditional lore.

Dr. Still begins his history with Hippocrates, the first physician who gave the profession a scientific spirit and ethical ideas. He, too, speaks of the child requiring different treatment from the adult, but beyond a brief summary of the diseases of children, and a series of thirty-two brief aphorisms concerning dentition and diseases of the throat, little appears in his numerous writings regarding the ailments of children. The earliest reference to diphtheria of which we know appears in two of the aphorisms in which he refers to the spreading membrane and the nasal voice following the development of paralysis. In one of his treatises he refers to the antenatal development of the fetus, and draws inferences from observation of the growth of the chick in the egg at different stages of its incubation. Later on he develops the theory that man's life is arranged in periods of seven, a strange theory, but one not entirely discarded by medical men till as late as the eighteenth century. Extracts from the writings of Aristotle, Celsus, Galen and Pliny follow in the next chapters, which represent all the important advances in our knowledge regarding the nurture of infants and the care and development of children during the next few centuries. A longer chapter is given to Soranus and his school in Ephesus. Obstetrician as he appears to have been, he added to his treatise on midwifery, the first detailed account of the care of infancy and the diseases of early childhood, of which we have any knowledge. Chapters devoted to Rhazes and Avicenna, physicians to the Grand Vizier at Ispahan in Persia, present an excellent picture of the Arabian school of medicine during the ninth and tenth centuries, and these are followed by a review of pædiatrics in mediæval times.

The discovery of printing in the fifteenth century proved a great stimulus to science and literature, and in this stimulation medicine shared. The almost forgotten writings of Hippocrates, Galen and the Arabian school reappeared in Latin, which at that date was the universal language of the profession, and stimulated thought and the careful observation of Nature. Knowledge began to increase, and Dr. Still records the numerous writings which appear chiefly on the continent of Europe. The output of printed works on diseases of children began with a treatise by an Italian Bagellardus in 1472, and between that date and the end of the fifteenth century two others appeared; one by a German and a third by a Belgian. England was slow in responding to the new stimulus. Out of sixteen writers on pædiatrics in the sixteenth century only one was English, and in the two hundred years following the invention of printing there were only two English writers, Phaer and Whistler, who brought out any original work on disease in children.

Thomas Phaer was the first Englishman to write on diseases of children in his own language. His *Boke of Children* was published in London in 1545 and ran through

SERUM TREATMENT *of Pneumonia*

UNTIL RECENTLY the use of an unconcentrated serum for Type I infections represented the only serum treatment for pneumonia which had gained general recognition. While this serum did not affect Type II, Type III or Group IV cases, it proved to be a very effective therapeutic agent in Type I cases in which it was used intravenously in large doses.

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many editions; the last is dated 1596. Dr. Still presents us with a delightful picture not only of the writer but also of the book. Of Phaer himself he writes that his name should be held in honour by all interested in the care of children. He made an English translation in rhythmical verse of Virgil's *Aeneid*, and, beyond making other excursions into poetry, presented many important facts regarding the care of children in verse easily remembered by mothers and nurses. Another hundred years passed before Daniel Whistler brought out in print the first description in English of rickets; and this was followed a few years later by the publication of another essay on the same subject by Francis Glisson whose remarks on the causes of rickets based upon clinical observations show how careful an observer he was. Another excellent work on diseases of children appeared a few years later written by Robert Pemell in regard to which Dr. Still gives a very full description both of the treatise and its writer. Then follow chapters containing the first description of chorea by Thomas Sydenham, the story of inoculation for small-pox, the first description of congenital hypertrophy of the pylorus, and the details of the establishment of the first children's dispensary by George Armstrong.

These titles represent only a few of the 57 interesting chapters in this book. In his brief introduction Dr. Still states that it has been his endeavour to trace the development of paediatrics and the advances made to our knowledge of disease in children by British writers. He has certainly presented us with no mere anthology, but with a series of charming biographical sketches of the more important leaders in medical thought both in Great Britain and on the continent whose writings have formed notable additions to our knowledge of paediatrics. The volume contains an unusual number of illustrations, all of a high order of merit, and printed on special paper. The reviewer has read the volume with the greatest interest. Every chapter makes delightful reading. The author in his introduction states that it has been a labour of love and, quoting Robert Pemell, states "it has been the work of rapt hours, snatched from the heavy demand of busy practice." The work is strongly recommended not only to all the members of our profession but to all who are interested in children.

Physiology and Biochemistry of Bacteria. Vol. 2. R. E. Buchanan, Ph.D., Professor Bacteriology, Iowa State College and Ellis I. Fulmer, Ph.D., Professor of Biophysical Chemistry, Iowa State College. 556 pages with 57 illustrations. Price \$7.50. Williams & Wilkins, Baltimore, 1930.

The content of this volume is indicated in the subtitle "Effects of Environment on Microorganisms". Environmental factors are classified as physical and chemical, and under these headings are discussed the effects on microorganisms of such factors as, temperature, rays and emanations, osmotic pressure, surface tension, high frequency sound waves, and the chemical nature of the environment. According to the authors "It is not the purpose of this volume or of the succeeding volume to review completely the very extensive literature on the subject of microbial physiology". In spite of this limitation the book should be of value to the research worker, particularly as a guide in exploring the literature of a problem.

Physiology and Biochemistry of Bacteria. Vol. 3. **Effects of Microorganisms upon Environment. Fermentative and Other Changes Produced.** R. E. Buchanan, Ph.D., Professor of Bacteriology, Iowa State College, and Ellis I. Fulmer, Ph.D., Professor of Biophysical Chemistry, Iowa State College. 575 pages. Price \$7.50. Williams & Wilkins Co., Baltimore, 1930.

In this volume the authors treat of the changes produced by microorganisms upon their environment. The first chapter deals with symbiosis of microorganisms with plants and animals. Special topics such as antibiosis, synergism, commensalism are discussed. Section E of the contents introduces the topic of agencies which produce chemical changes, namely, enzymes. Subsequent

chapters elucidate their action upon inorganic, non-nitrogenous, and nitrogenous organic compounds. Structural formulae and mathematical considerations as in other volumes are frequently encountered. Very distinctly this and the other volumes are written for research workers in the fields of bacteriology and biochemistry. For them the compilation of references to the literature bearing upon these subjects and their interrelations, is extremely valuable. The work, viewed from this angle, is monumental.

Human Anatomy (Piersol). G. Carl Huber, M.D., Sc.D., University of Michigan. Ninth Edition, revised 2,104 pages, 1,734 illustrations, of which 1,522 are original and 460 are in colour. Price, \$10.00. Philadelphia, Montreal, London: J. P. Lippincott Co., 1930.

Professor Huber has accomplished with conspicuous success the difficult task of bringing out this edition of Piersol's Anatomy. As a classic this monumental work deserves tender care at the hands of its revisers. Beyond absolutely necessary changes in those parts which contained information at variance with the results of recent research, no great alterations have been made in the general text. The greatest amount of new material is to be found in the section on the nervous system. Recent discoveries on the origin and development of the blood cells have been included. Dr. Eliason has revised, without overstressing the purely surgical point of view, the sections on applied anatomy.

"Piersol" is too well-known by a whole generation of medical students, since the publication of the first edition in 1907, to require any detailed analysis of the characteristics or contents of the book. One wonders if the next generation will be as well grounded in the facts of human structure as that which has passed. The craze for "tabloid" courses, necessitating "tabloid" text-books, may crush out the desire to possess a full and authoritative text-book which is carried as a well-tried friend from the student book-shelf to an honoured place in the consulting room.

Anatomy in the Living Model. David Waterston, M.A., M.D., F.R.C.S.E., F.R.S.E., Bute Professor of Anatomy in the University of St. Andrews, etc. 255 pages, illustrated. Price 25/- net. Hodder and Stoughton, Ltd., London, 1931.

This might not inappropriately be described as a text-book of living anatomy. The study of the living model has undoubtedly been neglected in anatomy schools, owing in great measure to a restriction of the hours given in the medical curriculum to a fundamental subject like anatomy. Professor Waterston is certainly rendering a good service to the study of anatomy by directing attention to this deficiency. It is therefore high time that teachers broke away from conventional methods, and emphasized the fact that a correlation exists between structure and function.

In the first section of the book the physical and structural characters of the skin are discussed. Here many significant facts which are of importance to the student in his clinical career are effectively brought out. This is in marked contrast to the methods usually adopted in dissecting rooms, where the skin is too often regarded as something inert, which is to be hurriedly removed in order to get to the parts inside.

In the succeeding sections of the book the study of the surface of the body is taken up by regions. The sections dealing with the upper and lower limbs are treated in a novel and interesting manner, and the author has laid special emphasis on the mechanical phenomena that are associated with the movements of the joints. It is gratifying to note that the lymphatics have received the attention they deserve. The surface anatomy of the head, face and neck is dealt with in an attractive manner, and makes good reading. In this the reader is assisted by six full-page plates which are not too overburdened with detail, thus permitting the various structures to be recognized with ease. It will be observed that these plates form a progressive series representing the various layers

of the head and neck that would be exposed by dissection from the surface inwards. The topographical anatomy of the thorax and abdomen is quite a feature of the book, and is illustrated by fine full page coloured plates. These are, as in the case of the head and neck, arranged in serial order, so as to display the various layers that would be exposed by consecutive dissections. These plates should prove of great service to the student who wishes to make a hurried review of his anatomy studies prior to an examination. A useful addition to this section of the book is a discussion of the respiratory movements in the living model.

A serviceable addition to this book would have been a series of skiagrams, in view of the paramount importance of x-rays in clinical diagnosis. The book is liberally provided with illustrations, and it may be added that the author has been fortunate in securing the services of a skilled artist like Mr. J. T. Murray in the preparation of the coloured plates.

This book fills a real want. It is very readable, and we can recommend it with confidence to students and also to practitioners who wish to brush up their anatomy under attractive conditions.

Nursing in the Acute Infectious Fevers. George P. Paul, M.D., D.P.H., formerly Director of the Department of Hygiene and Industrial Health, Antioch College, Yellow Springs, Ohio. Fifth Edition. 295 pages. Price \$1.75. W. B. Saunders Co., London and Philadelphia; McAinsh & Co., Toronto, 1931.

The fifth edition of this well-known text-book on fever nursing is now available. This edition has undergone numerous minor revisions and a new chapter on undulant fever has been added. This book has been written for the nurse. Therefore, under the various diseases, etiology, pathology, symptomatology and diagnosis have been subordinated to a discussion of the nursing care and management. There are eighteen such chapters, each dealing with a single disease or group of diseases. In addition, there are general chapters dealing with the

transmission of communicable diseases, hygiene of the sickroom, diets, reduction of fever, child hygiene, and the detection of complications. In Part Three, a review is made of the various poisons, antiseptics, signs of toxicity from drugs, enemata, and topical applications, and a number of selected formulae are cited. There is a chapter on antitoxins and vaccines and one on urinalysis. This book should be a welcome addition to any nurse's library.

Surgical Nursing. Hugh Cabot, M.D., C.M.G., F.A.C.S., Senior Consultant, Mayo Clinic, and Mary Dodd Giles, B.S., R.N., Associate Professor of Nursing Education, Vanderbilt University. 428 pages, illustrated. Price \$3.00. W. B. Saunders Co., London and Philadelphia; McAinsh & Co., Toronto, 1931.

This contribution to the literature on nursing care appears to be a very valuable one, and should prove of assistance to the nurse engaged in surgical nursing or to those instructresses and doctors who have the privilege of teaching this subject. In the preparation of the text the two well-known collaborators have followed the principle, so widely accepted to-day, that the nurse should be given a general knowledge of the fundamental sciences and of the principles of the practice of medicine and surgery. Accordingly, this work is very broad in its treatment of surgical nursing, giving a general dissertation on inflammation, shock, thrombosis, tissue repair and other relevant topics. After a series of chapters on preoperative and postoperative management, on surgical fevers, and on joint and bone conditions, the authors have a series of seventeen chapters on regional surgery and its nursing, ranging from the scalp and skull to the prostate. In considering the various diseases and their nursing care, a review is made of the etiology, the classification, the symptoms, the complications, etc. The special nursing requirements are fully considered under each chapter. A feature of this work is the attention paid to urological nursing, bringing to the nurse much needed information on this rapidly changing field.

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One notes the omission of operating room technique and the methods of bandaging except for certain fractures; these are well handled in other special works. The illustrations are numerous, clear and up-to-date; several in colours are very well reproduced. The book is practical and can be recommended.

Clinical Allergy, Particularly Asthma and Hay Fever.

Francis M. Rackemann, M.D., Physician to the Massachusetts General Hospital, etc., 617 pages, 30 illustrations. Price \$10.50. New York: Macmillan Co.; Toronto: Macmillan Co. of Canada, 1931.

It is a long time, as time goes in the world of medical books, since a work on asthma as ambitious as this has been undertaken, and the need for it is considerable. Few subjects in medicine are bringing out more discussion than immunology, and the relations between it and allergic disease are so intimate that we require to be continually taking stock of current views. Dr. Rackemann is well qualified to supply this need. Few have as large and varied clinical sources to draw upon as he has, and no one has taken better advantage of his material. It is the combination of his own wide experience with the views and work of others that make the book so thorough and well balanced. The opening chapters on hypersensitiveness and its relationship with immunology are excellent. They do not stray into the realm of theories regarding anaphylaxis, theories whose intricacy is only equalled (if not intensified) by the complexity of the various terms coined to expound them. There is yet much to be explained in anaphylaxis and allied phenomena, but there is too a large body of ascertained fact which is within the grasp of the average medical man if presented clearly, and this is what Dr. Rackemann has done. As Dr. Zinsser puts it in his foreword to the book, Dr. Rackemann has been eminently successful in bringing the immunological point of view to the clinician and the clinical point of view to the immunologist.

On the treatment of asthma he is as cautious in speaking of "cures" as is anyone who deals with the disease. At the same time he shows what can be done in even the worst cases by attention to detail.

Hay fever is fully dealt with. It is interesting to note that, with all the methods of desensitization that have been tried, none has brought better results than that of pre-seasonal injection of the pollen extract, although this should be carried on into the season itself. It is becoming well recognized also that "cures" may be looked for in a certain percentage, if treatment is given regularly for four or five years. Against this, of course, there is the possibility that spontaneous recoveries from hypersensitiveness occur. This must never be lost sight of.

We have no hesitation in commending this as one of the best, and certainly most up-to-date books on a difficult and important subject.

Ante-Natal Care. W. F. T. Haultain, O.B.E., M.C., B.A., M.B., F.R.C.S.E., M.R.C.P.E., M.C.O.G., Senior Assistant Obstetric Physician, Edinburgh Royal Maternity and Simpson Memorial Hospital, etc., and E. Chalmers Fahmy, M.B., F.R.C.S.C., M.R.C.P.E., M.C.O.G., Assistant Obstetric Physician, Edinburgh Royal Maternity and Simpson Memorial Hospital. Second edition. 127 pages. Price \$1.50. Edinburgh: E. & S. Livingstone; Toronto: Macmillan Co. of Canada, 1931.

This book stresses two points which have appealed very strongly to the reviewer for years, and as its viewpoint is exactly the same as his, naturally he is prejudiced in its favour, and is bound to think it a good book. The two points are: (1) that treatment of the pre-eclamptic or nephritic mother should not be continued for any length of time unless there is marked improvement, but that termination of the pregnancy should be considered early, i.e., the mother's life and health should be considered of primary importance, and the fetus given to an entirely secondary consideration. I advocated this years ago in my own small circle, and now, in these days of unemployment, it seems to me more rational than ever;

(2) that forcible dilation of the cervix at any stage of pregnancy distinctly predisposes to shock. I am quite sure I have seen two fatalities from this. Many other books mention these points, but this book emphasizes them. It seems safe to say that the book is an admirable collection of sound and sane views, on a very timely topic, one, indeed which has only come to the front in the present century. It covers the ground from the first symptoms of pregnancy, giving diagnosis, hygiene, measurements, symptoms and treatment of the toxæmias, hæmorrhages, and other complications, with special chapters on pain in pregnancy, and venereal diseases, and even includes a short chapter on post-natal care. The work is well arranged, clearly and concisely written, easily readable and understandable, and well worth perusal by any one interested in the subject.

Infant Feeding in General Practice. J. V. C. Braithwaite, M.D., M.R.C.P., Physician, and Physician in Charge of Children Out-patients, Leicester Royal Infirmary and Children's Hospital, etc. 140 pages. Price 4/6. John Wright & Sons, Bristol, 1930.

The author has attempted to give to the general practitioner an answer to many of the questions that confront him daily in the care of infants. He has accomplished this purpose well and has condensed into an easily readable and yet compact form a large amount of valuable information. The stress laid upon the importance of breast feeding and its management in normal and in difficult situations is particularly commendable. The discussion of artificial feeding is to the point and sufficiently clear-cut to be practicable. Nutritional disturbances, as classified by Finkelstein, are discussed briefly but clearly and many helpful suggestions given as to their care. The only serious objection to the book might be taken in regard to the rather too liberal use of opiates advised in feeding disturbances.

Medical Jurisprudence and Toxicology. John Glaister, M.D., D.P.H., F.R.S.E., Professor of Forensic Medicine in the University of Glasgow; and John Glaister, Jr., M.B., Ch.B., M.D., D.Sc., Professor of Forensic Medicine in the University of Egypt, Cairo. Fifth edition. 954 pages, 132 illustrations. Price \$9.00. Edinburgh: E. & S. Livingstone; Toronto: Macmillan Co. of Canada, 1931.

This well-known text-book, which is one of the best in the English language for the practising physician, has been rewritten and enlarged by some 50 pages. This increase is spread fairly generally throughout the book. The medico-legal section is a very excellent one indeed, and has the great advantage of dealing largely with British law, as opposed to the American law as contained in many recent books published in the United States. The toxicological portion of the book includes some types of poisoning which do not appear in the previous edition. There seems to be no reference to the use of an activated charcoal as an antidote, and hardly enough attention is paid to treatment and prognosis, though very excellent from the medico-legal side. Glaister has had a wealth of experience, which makes his judgment on many of the difficult medical legal questions extremely valuable. The book can be recommended to physicians. It is well printed and a credit to the publishers.

BOOKS RECEIVED

General Medicine. Edited by George H. Weaver, M.D., and others. Practical Medicine Series. 848 pages. Price \$3.00. Year Book Publishers, 304 South Dearborn Street, Chicago, Series 1930.

Medical Clinics of North America. Vol. 14, No. 5. Chicago number. 300 pages, illustrated. Issued serially, every other month. Price \$18.00 (6 numbers). London and Philadelphia: W. B. Saunders; Toronto: McAlinsh & Co., 1931.